



PORTLAND HARBOR RI/FS
ROUND 2 GROUNDWATER PATHWAY ASSESSMENT
TRANSITION ZONE WATER SAMPLING
FIELD SAMPLING REPORT

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TABLE OF CONTENTS

TABLE OF CONTENTS	i
LIST OF FIGURES	ii
LIST OF TABLES	iii
LIST OF ACRONYMS	iv
1.0 INTRODUCTION	1
1.1 Round 2 Transition Zone Water Sampling Objectives	1
1.2 Report Organization	2
2.0 CHRONOLOGY AND SUMMARY OF SAMPLING OPERATIONS	3
2.1 Activities Preceding Round 2 Transition Zone Water Sampling.....	3
2.2 Transition Zone Water Sampling by Trident probe	4
2.3 Transition Zone Water Sampling by Small-volume Peepers.....	5
2.4 Bulk Sediment Sampling by Power Grab Sampler	6
3.0 FIELD SAMPLING PROCEDURES	7
3.1 Sampling Vessels, Navigation, and Positioning.....	7
3.2 Trident Sampling and Documentation.....	8
3.3 Small-volume Peeper Sampling and Documentation	9
3.4 Bulk Sediment Sampling and Documentation	10
3.5 Quality Assurance/Quality Control	11
3.6 Sample Identification, Handling, Storage, Transport, and Custody	12
3.7 Data Management	13
4.0 DEVIATIONS FROM THE ROUND 2 TRANSITION ZONE WATER FIELD SAMPLING PLAN	14
4.1 Sampling Method Deviations	14
4.2 Sample Station Location Deviations	15
4.3 Sample Collection Deviations	15
4.4 Laboratory Analysis Deviations.....	16
5.0 SUMMARY OF ROUND 2 GROUNDWATER PATHWAY ASSESSMENT SAMPLING ACTIVITIES.....	17
6.0 REFERENCES	18

Appendix A. Trident Field Data Sheets and Field Notes

Appendix B. Small-volume Peeper Field Notes

Appendix C. Power Grab Sampler Field Data Sheets

LIST OF FIGURES

- Figure 2-1. Kinder Morgan Linnton Transition Zone Water and Sediment Sampling Locations
- Figure 2-2. ARCO Transition Zone Water and Sediment Sampling Locations
- Figure 2-3. Gasco Transition Zone Water and Sediment Sampling Locations
- Figure 2-4. Siltronic Transition Zone Water and Sediment Sampling Locations
- Figure 2-5. Rhone Poulenc Transition Zone Water and Sediment Sampling Locations
- Figure 2-6. Arkema Acid Plant Transition Zone Water and Sediment Sampling Locations
- Figure 2-7. Arkema Chlorate Plant Transition Zone Water and Sediment Sampling Locations
- Figure 2-8. ExxonMobil Transition Zone Water and Sediment Sampling Locations
- Figure 2-9. Willbridge Transition Zone Water and Sediment Sampling Locations
- Figure 2-10. Gunderson Transition Zone Water and Sediment Sampling Locations

LIST OF TABLES

Table 2-1.	Summary of Transition Zone Water and Sediment Sample Counts – All Sites
Table 2-2.	Transition Zone Water and Bulk Sediment Sample Summary - Kinder Morgan Linnton
Table 2-3.	Transition Zone Water and Bulk Sediment Sample Analyses - Kinder Morgan Linnton
Table 2-4.	Transition Zone Water and Bulk Sediment Sample Summary – ARCO
Table 2-5.	Transition Zone Water and Bulk Sediment Sample Analyses – ARCO
Table 2-6.	Transition Zone Water and Bulk Sediment Sample Summary – Gasco
Table 2-7.	Transition Zone Water and Bulk Sediment Sample Analyses – Gasco
Table 2-8.	Transition Zone Water and Bulk Sediment Sample Summary – Siltronic
Table 2-9.	Transition Zone Water and Bulk Sediment Sample Analyses – Siltronic
Table 2-10.	Transition Zone Water and Bulk Sediment Sample Summary – Rhone Poulenc
Table 2-11.	Transition Zone Water and Bulk Sediment Sample Analyses - Rhone Poulenc
Table 2-12.	Transition Zone Water and Bulk Sediment Sample Summary – Arkema Acid Plant
Table 2-13.	Transition Zone Water and Bulk Sediment Sample Analyses - Arkema Acid Plant
Table 2-14.	Transition Zone Water and Bulk Sediment Sample Summary - Arkema Chlorate Plant
Table 2-15.	Transition Zone Water and Bulk Sediment Sample Analyses - Arkema Chlorate Plant
Table 2-16.	Transition Zone Water and Bulk Sediment Sample Summary – ExxonMobil
Table 2-17.	Transition Zone Water and Bulk Sediment Sample Analyses – ExxonMobil
Table 2-18.	Transition Zone Water and Bulk Sediment Sample Summary – Willbridge
Table 2-19.	Transition Zone Water and Bulk Sediment Sample Analyses – Willbridge
Table 2-20.	Transition Zone Water and Bulk Sediment Sample Summary – Gunderson
Table 2-21.	Transition Zone Water and Bulk Sediment Sample Analyses – Gunderson
Table 4-1.	Summary of Sample Collection Deviations from the Field Sampling Planning Documents

LIST OF ACRONYMS

CAS	Columbia Analytical Services
COI	chemical of interest
DGPS	differential global positioning system
DI	de-ionized
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
EQuIS	Environmental Quality Information System
FSP	field sampling plan
GPS	global positioning system
LWG	Lower Willamette Group
NAD	North American Datum
NAPL	nonaqueous phase liquid
ORP	oxidation reduction potential
PAH	polycyclic aromatic hydrocarbon
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RI/FS	remedial investigation and feasibility study
SAP	sampling analysis plan
SOP	standard operating procedure
SVOC	semivolatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TPH-D	diesel-range total petroleum hydrocarbon
TPH-G	gas-range total petroleum hydrocarbon
TPH-R	residual-range total petroleum hydrocarbon
TZW	transition zone water
VOC	volatile organic compound

1.0 INTRODUCTION

This field sampling report describes transition zone water and associated bulk sediment sample collection activities performed as part of the Round 2 Groundwater Pathway Assessment for the Portland Harbor Superfund Site (Site) in Portland, Oregon. The Groundwater Pathway Assessment is an element of the remedial investigation and feasibility study (RI/FS) for the Site. The RI/FS is being conducted to investigate the nature and extent of contamination in the in-water portion of the Site, to assess potential risk to human health and the environment, and to develop cleanup alternatives.

The Round 2 Groundwater Pathway Assessment sampling activities were performed between October 3 and December 2, 2005. Except where noted, all Round 2 Groundwater Pathway Assessment sampling activities, including navigational positioning, sample collection, sample handling and processing, and data management, followed guidelines specified in the following planning documents:

- Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan (SAP; Integral 2005e)
- SAP Attachment 2, Transition Zone Water Field Sampling Plan (TZW FSP; Integral 2005h)
- TZW FSP Addendum 1 (Integral 2005a)
- TZW FSP Addendum 2 (Integral 2005b)
- Round 2 Quality Assurance Project Plan supplement (QAPP supplement; Integral 2005d)
- Round 2 Groundwater Pathway Assessment Health and Safety Plan (Integral 2005c).

The SAP, TZW FSP, TZW FSP Addenda 1 and 2, and the Round 2 QAPP supplement are currently being revised. These revisions are being prepared following completion of the subject field work (completed December 2, 2005) to provide complete and final documents, which incorporate comment responses and reflect the modifications to the sampling effort agreed upon for conditional approval by U.S. Environmental Protection Agency (EPA) and their agency partners.

1.1 ROUND 2 TRANSITION ZONE WATER SAMPLING OBJECTIVES

The overall goal of the Round 2 Groundwater Pathway Assessment is to determine whether discharges of groundwater-related chemicals of interest (COIs) contribute to unacceptable risks to human health or the environment within the Site. The objective of Round 2 transition zone water sampling was to collect and analyze samples of transition zone water to quantify concentrations of groundwater-related

COIs in areas of plume discharge identified during the groundwater discharge mapping field effort.¹ Additionally, sediment samples were collected at a subset of locations where existing sediment chemical data are not available and to support chemical partitioning analysis. As described in the SAP, the following nine sites were included in the Round 2 transition zone water sampling effort:

- ExxonMobil Oil Terminal
- Gasco
- Siltronic
- Arkema Acid and Chlorate Plant
- Kinder Morgan Linnton Terminal
- ARCO Terminal 22T
- Rhone Poulenc (Bayer)
- Willbridge Bulk Fuels Terminal
- Gunderson.

1.2 REPORT ORGANIZATION

This report is organized in six sections. Section 2 provides a chronology and summary of the Round 2 transition zone water sampling activities. Section 3 documents sample collection, handling, and documentation procedures followed in the field, as well as data management procedures. All deviations from the TZW FSP (Integral 2005h) and QAPP (Integral 2005d) are noted and explained in Section 4. Finally, a brief summary of the sampling effort is presented in Section 5, followed by a list of references in Section 6. Field data sheets are provided in Appendices A, B, and C.

Note: Validated analytical results from this sampling program are not yet available.

¹ The findings of the Round 2 groundwater discharge mapping field effort are presented in the TZW FSP Addenda 1 and 2 (Integral 2005a,b).

2.0 CHRONOLOGY AND SUMMARY OF SAMPLING OPERATIONS

This section presents the chronology of the transition zone water sampling activities of the Round 2 Groundwater Pathway Assessment program, including a brief discussion of preceding events for context. An overall summary of samples collected at each site is presented in Table 2-1. Additionally, tabular and graphical summaries of all collected samples and requested analyses are presented, by site, in Figures 2-1 through 2-10 and Tables 2-2 through 2-21. Deviations in sample collection from the field sampling planning documents (Integral 2005a,b,h,d) are identified in the tables and detailed in Section 4.

2.1 ACTIVITIES PRECEDING ROUND 2 TRANSITION ZONE WATER SAMPLING

Prior to development of the Round 2 Groundwater Pathway Assessment SAP (Integral 2005e), a pilot study was conducted in late 2004 and early 2005 to evaluate selected groundwater discharge mapping tools and transition zone water sampling methods under realistic field conditions (Integral 2004). Results of the pilot study, presented in the Groundwater Pathway Assessment Pilot Study Data Report (Integral 2005f) and discussed in the TZW FSP Attachments 1 and 2 (Integral 2005g,h), were used to develop the Round 2 Groundwater Pathway Assessment approach to transition zone water sampling design.

Based on findings of the pilot study, a two-step approach was developed and applied to collect transition zone water and sediment samples for the Round 2 Groundwater Pathway Assessment. In the first step, potential areas of groundwater discharge were identified through discharge mapping. Discharge mapping consisted of an assessment of existing site upland and in-water hydrogeologic and chemical data, followed by collection of stratigraphic coring data, transect-based discharge mapping (temperature and conductivity measurement using the Trident Probe), and discharge verification measurements using seepage meters. Additionally, screening samples of transition zone water were collected at a subset of locations for preliminary screening-level chemical analysis of select groundwater COIs. The results of the discharge mapping effort and the selection of the transition zone water sampling locations are presented in Addenda 1 and 2 to the TZW FSP (Integral 2005a,b).

The purpose of groundwater discharge mapping was to identify locations for transition zone water sampling, which was the second step of the Round 2 Groundwater Pathway Assessment. Based on findings of the pilot study, two complementary transition zone water sampling techniques were selected for the Round 2 data collection: Trident sampling and small-volume peeper sampling. Additionally, bulk sediment sample collection by the power grab sampler was planned to address sediment characterization data gaps in the vicinity of transition

zone water sampling locations. A brief description of the Trident, small-volume peeper and power grab sampling techniques is provided in Section 3, and detailed discussion of these techniques is presented in the Pilot Study Field Sampling Plan (Integral 2004) and in the TZW FSP (Integral 2005h).

The Round 2 Groundwater Pathway Assessment sample collection by the Trident, small-volume peeper, and power grab sampling techniques was performed between October 3 and December 2, 2005. The following sections provide a summary description of the sampling conducted by each of these three methods, as well as the chronology of the sampling activities.

2.2 TRANSITION ZONE WATER SAMPLING BY TRIDENT PROBE

Trident sampling was completed between October 3 and October 28, 2005. In accordance with the TZW FSP (Integral 2005h), locations targeted for transition zone water sampling which had coarse- to moderately coarse-grained sediment textures were first attempted using the Trident probe positioned at a depth of 30 cm below the mudline. If sufficient flow rates (>20 mL/min) could not be achieved at a given location, sampling by Trident was abandoned, and the location was later targeted for sampling by small-volume peepers. Trident sampling was also attempted at locations specified in the planning documents (Integral 2005a,b,h) for transition zone water collection at a depth of 90 to 150 cm below the mudline. Small-volume peeper sampling was not targeted at the 90- to 150-cm depth locations where the Trident yielded insufficient flow to collect samples due to the inability to deploy the peeper samplers at depths below 38 cm.² Field measurements of select water quality parameters were collected at all Trident locations as specified in the TZW FSP (Integral 2005h). In addition to the specified field parameters of pH, conductivity, and turbidity, temperature and oxidation reduction potential (ORP) were also measured at most sampling locations.

Samples collected by the Trident are presented along with other sampling methods, by site, in Figures 2-1 through 2-10 and in Tables 2-2 through 2-21. The tables include information on sediment texture observations, coordinates, purge rates, river water depth, transition zone water sample depth below the mudline, and chemical analyses requested from the laboratory. Copies of the original field data sheets are presented in Appendix A. In all, 191 transition zone water samples, including replicate samples and paired filtered samples, were collected at a total of 80 distinct locations. Of these 191 samples, 155 samples were collected by the

² Peepers are manually inserted into the sediment by a diver. Burial of the peepers at depths greater than 38 cm would require significant excavation, resulting in severe disturbance of the surrounding sediments and likely loss of fine materials.

Trident probe (the remaining 36 samples were collected by small volume peepers³, discussed in the following section). Of the Trident probe samples, 117 were collected at 30 cm depth below the mudline and 38 were collected at 90 to 150 cm depth below the mudline. Paired filtered samples were collected at 78% of the target Trident samples, resulting in 57% collection of paired filtered samples across the target transition zone water sampling effort.

Sample collection by Trident at 30-cm depth was more successful than anticipated in fine-grained sediments due to simultaneous use of two adjacent Trident sampling points at this sampling depth. This effectively doubled the achievable flow rate, increasing the number of locations meeting the sampling cutoff of 20 mL/min. This procedural modification/improvement is discussed further in Section 3.2.

2.3 TRANSITION ZONE WATER SAMPLING BY SMALL-VOLUME PEEPERS

In accordance with the TZW FSP (Integral 2005h), initiation of transition zone water sampling using small-volume peepers was staggered behind the Trident sampling to allow for deployment of peepers at the 30-cm locations where the Trident system could not meet the specified flow rate. Small-volume peepers were deployed in two mobilizations and, following equilibration, were retrieved in two subsequent mobilizations. Sampling of transition zone water by small-volume peepers was performed at all study sites except ExxonMobil, where the Trident successfully collected all targeted samples. All sampling locations are shown on Figures 2-1 through 2-10. Samples are listed individually in Tables 2-2 through 2-21, along with sample information details and requested analyses.

The first peeper deployment took place October 17 through 20, 2005. 17 sets of peepers (a total of 89 individual small-volume peeper devices) were installed during this first deployment offshore of the ARCO, Siltronic, and Arkema (former Acid Plant and Chlorate Plant areas) sites. The peepers were allowed to equilibrate for three weeks, and then retrieved between November 14 and 18, 2005.

The second deployment mobilization took place October 31 through November 3, 2005. 19 sets of peepers (a total of 78 individual small-volume peeper devices) were deployed during this phase offshore of the Kinder Morgan, Gasco, Rhone Poulenc, Willbridge, and Gunderson sites. The peepers were allowed to equilibrate for three weeks, and then retrieved between November 28 and December 1, 2005.

Of the 36 sets of small-volume peepers deployed, nine were replicates (one replicate pair was deployed at each site where peeper sampling was performed). In

³ All 36 small-volume peeper sampling locations represent sediment textures not conducive to Trident sampling. Several of these were first attempted with the Trident; however, due to schedule limitations, locations where sediment textures were well-known were not attempted with the Trident.

accordance with the TZW FSP (Integral 2005h), no filtered samples were collected from the small-volume peepers due to volume limitations.

2.4 BULK SEDIMENT SAMPLING BY POWER GRAB SAMPLER

To avoid disturbance/damage of the peepers during the equilibration period, collocated bulk sediment sampling was not performed at a given site until the peeper retrieval was complete. The bulk sediment sampling took place between November 29 and December 2, 2005. The sediment samples were collected from transition zone water sampling locations where bulk sediment chemistry data results were not available within approximately 50 feet for a similar sediment type.

A total of 38 bulk sediment samples were collected by power grab sampler across the nine study sites, with two to six locations sampled at each site. Of these, four were replicate samples. Power grab sampling locations are shown on Figures 2-1 through 2-10. Samples are listed individually in Tables 2-2 through 2-21, along with sampling depths and requested analyses.

3.0 FIELD SAMPLING PROCEDURES

The following sections summarize the procedures and methods used to collect transition zone water and bulk sediment samples for the Round 2 Groundwater Pathway Assessment. Detailed procedures specified in the standard operating procedures (SOPs) in the TZW FSP (Integral 2005h) are briefly summarized or referenced here to provide context for documentation of additional details of implementation. Specifically, on-water logistics, sample collection procedures, quality assurance/quality control procedures, sample handling, and data management are described as implemented in the sampling effort. All sampling procedures followed the specifications of the TZW FSP (Integral 2005h), except as noted in Section 4.0, which summarizes deviations from the planning documents.

3.1 SAMPLING VESSELS, NAVIGATION, AND POSITIONING

One sampling vessel was used for the Trident probe transition zone water sampling. Coastal Monitoring Associates provided a 20-foot Carolina skiff fitted with a 90-horsepower engine and a cabin to store a computer-integrated differential global positioning system (DGPS) navigation system and all sampling equipment. Bow and stern anchors were deployed to hold the skiff on position at each sampling location during sampling. The foredeck was used for Trident probe deployment and as a peristaltic pump and sample collection staging area. At each Trident probe sampling location, the DGPS receiver was placed on top of the Trident base stabilizing poles, and remained in place for the duration of sampling at that station. Mean coordinates were calculated and recorded on the field data sheets (Appendix A).

For the small-volume peeper sampling, Research Support Services provided a 24-foot aluminum boat fitted with a removable shelter, A-frame, winch, and Garmin GPS/chartplotter and Nobeltec navigation software. The boat was either tied to pilings or bow and stern anchors were deployed, as needed, to maintain the boat's position at each sample location. The foredeck was used for diver staging, diver line tending, peeper deployment/retrieval, and sample processing. A 12.5-foot inflatable boat was tied to the main vessel and was used for extra equipment storage and sampling crew transport.

For the bulk sediment sampling, Marine Sampling Systems provided the power grab sampling device as well as the research vessel *Peter R*, a flat-deck, 26-foot catamaran with twin, 120-horsepower engines. The *Peter R* is equipped with a hydraulically operated A-frame with a boom, a 1,000-lb capacity hydraulic winch, and a computer-integrated DGPS navigation system. The DGPS receiver was situated on top of the A-frame over the sampling equipment to record the most accurate position for each sample. A position was recorded when the sampling

device first impacted the sediment surface. Horizontal positions were acquired using a Trimble AG132 DGPS.

On all three research vessels, the DGPS receiver outputs station positions to the integrated navigation software package. The GPS receiver displayed and transmitted data to the computer in North American Datum 1983 (NAD83) geographic coordinates (latitude/longitude). The integrated navigation system, acting as a data manager, displayed the vessel's position relative to a proposed sampling location in plan view on an onboard video screen. The screen display and numeric navigation data, including range and bearing to the target sampling location, assisted the vessel operators in approaching and maintaining a station position while sampling. The actual geodetic coordinates for all locations sampled were used for generating Figures 2-1 through 2-10, and are included in the even-numbered sample location summary Tables 2-2 through 2-20.

3.2 TRIDENT SAMPLING AND DOCUMENTATION

The Trident probe is a simple, direct-push system equipped with temperature, conductivity, and water sampling probes. Transition zone water is collected through a small-diameter, Teflon[®]-coated, stainless-steel probe. The tip of the probe holds a sample port covered by a small mesh stainless-steel screen. Aluminum poles were used to drive the Trident probe to the desired depth in the sediment. Water is drawn through tubing connected to the sampling probe using a peristaltic pump. A clean sand pack was placed over the sampling probe prior to collection of each sample to minimize clogging of the intake by silt and clay.

The Trident probe was used to collect transition zone water samples at a depth of 30 cm below the mudline, as well as samples at depths of 90 to 150 cm below the mudline at a subset of locations. A minimum transition zone water purge rate of at least 20 mL/min, as specified in the TZW FSP, was required in order to minimize the loss of volatile chemicals from the water samples during sample collection. At sample locations sampled at 30-cm depth where low-permeability sediments (silts, clays) resulted in purge rates of less than 20 mL/min, the Trident probe was repositioned a maximum of 2 times within 10 feet of the target location and the purging process repeated. If low yield rates persisted following repositioning, the location was scheduled for sampling with small-volume peepers. If purge rates at 90- to 150-cm depths could not meet the 20-mL/min minimum requirement after three attempts, the station was abandoned (small-volume peeper sampling could not be performed at this depth). Specific Trident sampling deviations from the FSP are detailed in Section 4.0.

Prior to collection of each sample, the Trident probe was washed with Alconox[™] and rinsed with de-ionized (DI) water. The stainless steel screens and sampling ports were fully decontaminated following the procedures detailed in the TZW FSP

(Integral 2005h). Additionally, at each sample station, a new sand pack, which had been triple-rinsed with DI water, was placed around the Trident sample intake point. To minimize sample cross-contamination, the nitrile gloves worn by the crew were replaced between each sampling location. Decontamination rinse waters were discarded into the river.

Integral staff recorded field activities and observations in bound field logbooks. This information included personnel, date, time, station designation, sampler type, sample collection specifics, and general observations. Any deviations from the TZW FSP were also documented in these field logbooks.

A sample collection log sheet was completed following sampling operations at each station (Appendix A). This log sheet included station designations, types of samples to be collected, and any other relevant sampling information (e.g., collection of field replicates, additional sample volumes for laboratory quality control, etc.). Water quality parameters were also recorded on these log sheets during Trident probe sampling. Additionally, samples collected by Trident probe and requested analyses are detailed in Tables 2-2 through 2-21.

3.3 SMALL-VOLUME PEEPER SAMPLING AND DOCUMENTATION

The small-volume peepers used during Round 2 transition zone water sampling are commercially available, 6-inch × 18-inch plate peepers, manufactured by Rickly Hydrological Company. Each plate peeper is equipped with 28 rows of sample ports ranging in volume between 3.5 and 9 mL, and is capable of collecting a total of approximately 225 mL of water over a 38-cm sediment depth. The peepers were fitted with an approximate 5- μ m Teflon[®] membrane.

Prior to deployment, the new small-volume peepers were decontaminated using Alconox[™] and DI water (DI water for peeper rinsing and soaking was provided by Cedar Canyon). Following decontamination, the peepers were filled with anoxic DI water. The entire peeper assembly was maintained in an anoxic (argon-sparged) water bath until immediately prior to deployment. The small-volume peepers were deployed manually by a diver, using hand strength or a small mallet to push the peepers directly into the sediments such that the uppermost sampling port was just below the sediment mudline. Two to six peepers were deployed at each sampling location, as necessary, to achieve sufficient total sample volume for required analyses. Peepers were deployed in a grid pattern, separated by 2 ft in each direction. Each grid was 2 ft wide (one peeper on each end). The grid length depended on the number of peepers to be deployed, with each separated by 2 ft.

All of the peepers were left in place to equilibrate for a 3-week period, after which they were retrieved by a diver. Water was then extracted from each of the sample ports of each peeper by inserting a new, sterile syringe needle through the

membrane and extracting the water into a syringe. The water in the syringe was then discharged to the appropriate sample bottle. Each sample bottle was filled with water from sample ports distributed across the entire set of peepers to ensure that the composite sample was representative of the entire 38-cm vertical depth, as well as integrated laterally. Laminated, prefabricated extraction templates, specific to each site and analyte list, were used to guide the extraction, and were found to greatly increase processing efficiency.

Integral staff provided onboard project oversight, performed all sample collection activities once peepers were retrieved to the surface, and recorded field activities and observations in bound field logbooks. This information included personnel, date, time, station designation, sampler type, sample collection specifics, and general observations. Any changes or deviations from the TZW FSP were documented in these field logbooks. Small-volume peeper field notes are presented in Appendix B. Samples collected by small-volume peepers and requested analyses are detailed in Tables 2-2 through 2-21.

3.4 BULK SEDIMENT SAMPLING AND DOCUMENTATION

Bulk sediment sampling was performed using a commercially available, stainless steel, hydraulic power grab sampler with footprint area of 0.3 m² and a sample depth of up to 30 cm. The targeted surface sediment sampling interval was 0 to 30 cm below the sediment-water interface, with a minimum acceptable penetration depth of 20 cm.

Once an acceptable grab sample was obtained, overlying water was siphoned off the top of the grab. An experienced Integral staff geologist described the contents of the grab and recorded the description onto a sample log sheet. Sample time, penetration depth, texture/grain size, sediment color, notable odors, debris, and sample quality were recorded on the timesheets. The log sheets are provided in Appendix C.

With a minimum penetration depth of 20 cm into the sediment, a single cast of the power grab sampler provided adequate sediment volume for all required analyses. Once logged, samples for volatile organic compounds (VOCs), gasoline-range total petroleum hydrocarbons (TPH-G), and/or total sulfides were subsampled directly from the grab with a small stainless-steel spoon prior to homogenization, and placed directly into the appropriate sample jars. Sediments for these subsamples were collected as a vertically integrated sample from the top to the bottom of the grab. Following collection of the sample for volatiles analysis, 3 liters of sediment were removed from the power grab sampler using a spoon and placed in large stainless-steel bowl for mixing. The sample was mixed using the spoons until it was fully homogenized (i.e., a uniform color and texture) and subsamples were then transferred to the appropriate glass sample jars provided by the analytical laboratory

for chemical analyses. Decontamination procedures for all sample handling and homogenization equipment (e.g., stainless-steel spoons and bowls) followed procedures described in the TZW FSPs.

Integral staff provided onboard project oversight, performed all sample handling, and recorded field activities and observations in bound field logbooks. This information included personnel, date, time, station designation, sampler type, sample collection specifics, and general observations. Any deviations from the TZW FSP were documented in these field logbooks. Sample and lithologic observations recorded during the power grab bulk sediment sampling are presented in Appendix C. Samples collected by the power grab sampler and requested analyses are detailed in Tables 2-2 through 2-21.

3.5 QUALITY ASSURANCE/QUALITY CONTROL

Field quality assurance/quality control (QA/QC) samples were collected in accordance with the specification in the TZW FSP and Addendum 1 and 2. The QA/QC sampling program consisted of rinsate samples, replicate samples, additional sample volume for lab QA work, and trip and temperature blanks. All field-collected QC samples are presented in Tables 2-2 through 2-21, and described further below.

Rinsate samples (equipment rinsate blanks) for the Trident system were collected in the field, following equipment decontamination procedures. Equipment rinsate blanks were collected from the peepers using different two methods: one for VOC analytes, and one for non-VOC analytes. New peepers received from the supplier were cleaned in accordance with decontamination procedures prior to sampling. For the peeper VOC rinsate, one peeper was cut into six sections and placed in a 32-ounce, clear, wide-mouth jar filled with DI water and sealed with a Teflon[®]-lined cap. After four weeks, the water in the jar was transferred to VOA vials for VOC analysis. For the non-VOC peeper rinsate, two whole peepers were soaked in DI water in large, sealed Teflon[®] bags for one month. At the end of this equilibration period, the water was sampled and submitted to the laboratory. No rinsate samples were collected as part of the power grab sampling program (as specified in the TZW FSP).

Replicate samples were collected with the Trident samples at the specified frequency of one per site for the 30-cm sampling depth. At the 90- to 150-cm sampling depth, only three replicate samples could be successfully collected due to limitations in the ability to produce adequate sample volume. TZW FSP Addenda 1 and 2 (Integral 2005a,b) specify that replicates at 90- to 150-cm sampling depth will be collected at a frequency of one per site, where possible. For the sediment sampling by power grab sampler, four replicate samples were collected, meeting the 10% replicate requirement specified in the TZW FSP.

Due to transition zone water volume limitations associated with the Trident and small-volume peeper sampling techniques, the sample volumes collected were limited to the least amount required to meet required minimum reporting limits. To allow for complete internal laboratory QA/QC work, additional volume (typically tripling the minimum volume) is required. Additional volume for internal laboratory QA/QC was provided for Trident samples at a frequency of one per site, as planned. Also, as planned, no additional volume for laboratory QA/QC was provided as part of the peeper sampling due to even more restrictive volume limitations.

Laboratory-provided trip blanks and temperature blanks were included in all sample coolers and were submitted to the laboratory for analysis, as specified in the QAPP (Integral 2005d).

3.6 SAMPLE IDENTIFICATION, HANDLING, STORAGE, TRANSPORT, AND CUSTODY

All samples were assigned a unique identification code, as described in the FSP, based on a sample designation scheme designed to meet the needs of field personnel, data management and data users. This code indicates the project phase, sample type, and level of replication/duplication. Station location identification numbers for each target location are listed in Tables 2-2 through 2-21 and mapped in Figures 2-1 through 2-10.

Trident probe water samples, small-volume peeper water samples, and bulk sediment samples were collected as described in Sections 3.2, 3.3 and, 3.4, respectively. Following collection, transition zone water sample containers were capped and labeled. Similarly, sediment sample jars were capped, labeled, and individually bagged. All samples were stored in a cooler on ice until the end of each day, when samples were either stored in secured refrigerators at the field laboratory located in Portland (3247 NW 29th Avenue) or were shipped on ice directly to the analytical laboratory.

Samples were packed for shipping to prevent breakage and were separated in the shipping container by bubble wrap and/or other shock-absorbent material. Loose ice was then placed in the cooler to maintain a temperature of approximately 4°C. Sample chain-of-custody forms were established in the field for each sample prior to shipment, and copies of chain-of-custody forms were placed into a zip-locked bag and taped on the inside lid of each cooler. A complete set of the project chain-of-custody forms were kept in the project file at Integral's Portland, OR office. Each cooler was sealed with shipping tape and three chain-of-custody seals, which included the project name, date of shipment, and the name of the person sealing the cooler. Samples were transported directly to the analytical laboratory by a courier

provided by the laboratory. Shipments were typically made within 48 hours of sample collection.

3.7 DATA MANAGEMENT

Laboratory analysis and data validation of Round 2 transition zone water and sediment samples is anticipated to be completed near then end of February 2006. This section describes data management procedures that will be followed to manage laboratory data.

Following internal laboratory QA/QC procedures, analytical data (including sample identifiers and results) will be exported into comma-delimited text files designed for recognition by the project's Environmental Quality Information System (EQuIS) database. These text files will be sent to Integral as electronic data deliverables (EDDs). Upon receipt, EDDs will be checked for proper EQuIS structure, and will be appended with additional information (e.g., sampling location, field replicate and split information, etc.). Any problems identified in the structure of the EDDs will be reported to the laboratory, and the EDDs were subsequently corrected and resubmitted. Each EDD transmission, along with the original, unaltered EDD attachment, will be stored to document and track all electronic data submissions. Accuracy of completed EDDs will be verified electronically in EQuIS.

The electronic verification process incorporates checks for correct lookup codes (such as for analytes, test methods and sample matrices) and proper relationships for results, tests, batches and samples. The process also checks that all derived samples (such as replicates, splits, and matrix spikes) had corresponding parent samples. In addition, EQuIS verifies other characteristics, such as date and time formats and text field lengths, to ensure consistency throughout the database. Any errors would prevent the EDD from loading until the error was corrected. Errors related to laboratory reporting or EDD construction will be corrected by the laboratory, and the EDD will be subsequently resubmitted. All successfully loaded EDDs will be saved in order to document and track all data loaded into Integral's Lower Willamette Group (LWG) project database.

Each verified EDD will be provided to the Round 2 data validation contractor (EcoChem, Seattle, WA) for data review and validation. Throughout the validation process, qualifiers and reason codes will be applied to the data in the temporary section of the database. The validated data will then be merged into the permanent project database. During the merging process, all previously performed electronic checks were repeated. The data will also be translated into a form compatible with NOAA's Query Manager. Integral's LWG permanent project database will contain all final data reported by the analytical laboratory, including field and lab replicates, lab dilutions, results for the same analyte from multiple analytical methods, and laboratory QA samples such as matrix spikes, surrogates, and method blanks.

4.0 Deviations from the Round 2 Transition Zone Water Field Sampling Plan

This section presents all deviations from the TZW FSP (Integral 2005h) and supporting planning documents, including Addenda 1 and 2 (Integral 2005a,b), and QAPP supplements (Integral 2005d; Integral, in press). Deviations from planned sampling methods, sample collection, and laboratory procedures are presented in the following sections.

4.1 SAMPLING METHOD DEVIATIONS

In the field, there were two deviations from the sampling methods described in the SOPs in the TZW FSP (Integral 2005h). Both deviations were performed to allow for sample collection where sampling would have otherwise not been possible. These two deviations are described below:

- To increase the production flow rate of transition zone water from the Trident system, two sampling points (instead of one) were attached at 30-cm depth settings to the mounting base. The two intake points were identical and included Teflon[®]-coated, stainless steel probes, with a sample port at the base consisting of a slot covered by a small mesh (241- μ m) stainless-steel screen. The two probes fed into the same outlet tubing via a Teflon[®]-lined 'T' valve. This allowed the suction pressure to drop by half on each of the sediment interface screens while maintaining the same pump rate. This modification is responsible for the better-than-anticipated sampling success of the Trident tool in fine-grained sediments at the sampling depth of 30 cm. It is possible that such a modification may have also been applied for the deeper samples (90 – 150 cm); however, only one sample intake was available for these deeper samples (fabrication of this equipment was special-ordered for this project). The modified two-intake setup was used at all 30-cm depth Trident sampling locations.
- During bulk sediment sampling activities with the power grab sampler, it was discovered that proposed sediment sampling station KM-8-A (at the Kinder Morgan site) was inaccessible to the sample vessel due to obstruction by facility dock pilings. Therefore, the boat-mounted power grab system could not be used. To allow for sampling of sediment at this location, the boat was beached near the target location to allow sampling crews to go ashore. The sampling crews used a hand-held DGPS to pinpoint the target location, and then proceeded to collect a sediment sample using clean, stainless-steel sampling spoon and bowls. The station was shallow enough to allow for the top 30 cm of sediment to be removed manually and placed in the stainless-steel bowls. The sample was then processed in the same manner as the power grab samples.

4.2 SAMPLE STATION LOCATION DEVIATIONS

This section describes deviations from the target sampling locations. Deviations in collection of samples (planned samples which were not collected) are described in the following section (4.3). Most samples were successfully collected within 25 feet of the target locations. The exceptions to this are listed and briefly discussed below:

- **SLT1-A** – The 30-cm transition zone water sample from SLT1-A at the Siltronic site was collected by Trident at a position roughly 50 feet offshore of the target location (see Figure 2-4). This slight positioning error was not discovered until the actual positions were plotted. According to the field notes, the sample was collected from the targeted, near-shore sand zone, though it was a bit farther offshore than intended.
- **W-09-A** – The 30-cm transition zone water sample from W-09-A at the Willbridge site was collected by Trident at a position roughly 30 feet offshore and downstream of the target location (see Figure 2-9). This slight positioning error was not discovered until the actual positions were plotted.
- **RP-07-E** – In accordance with the letter of conditional approval received by EPA on October 13, 2005 (EPA 2005, pers. comm.), RP-07-E at the Rhone Poulenc site was targeted as far offshore as practicable; however, due to gravel encountered by the diver deployment of the peeper devices, the small-volume peepers could not be deployed farther offshore than the original RP-07-E target location.
- **EM-06-B** – The 30-cm transition zone water sample from EM-06-B at the ExxonMobil site was collected by Trident at a position roughly 50 feet upstream of the target location (see Figure 2-8), due to concern for the sampling vessel given the presence of pilings near the target location.

4.3 SAMPLE COLLECTION DEVIATIONS

Most of the targeted transition zone water and sediment samples were collected and submitted for analyses as planned. There were, however, a number of deviations from the plan either from inability to collect samples or inability to collect adequate volume for analysis of all analytes. Nearly all of these deviations were attributable to access limitations (primarily due to in-water remedial activities at the Gasco site) or inability of the sampling tools to produce adequate sample volume⁴. In one instance (RP-03-C), however, incorrect analyses were unintentionally

⁴ Volume limitations were anticipated in the TZW FSP (Integral 2005h), particularly for the 90- to 150-cm samples for which backup small-volume peeper sampling was not possible. These are listed with unanticipated deviations to provide a complete documentation of volume limitation issues.

specified on the chain-of-custody form submitted to the laboratory⁵. All deviations and associated explanations are documented in Table 4-1.

4.4 LABORATORY ANALYSIS DEVIATIONS

A complete set of results has not yet been received from the analytical laboratory [Columbia Analytical Services (CAS); Kelso, WA]. As such, a complete account of any deviations from the planned laboratory analyses is not yet available. To date, the laboratory has reported only one case of deviation from the QAPP (Integral 2005d). Because of the extremely high salinity in transition zone water samples collected from the Arkema site, ranging from 1.2 to 106.2 mS/cm, the laboratory specified the need for additional sample volume for metals analyses. Specifically, on October 11, 2005, CAS indicated that they required a minimum volume of 620 mL for analysis of metals in high salinity samples. The previous target volume was 120 mL. The additional sample volume was needed to perform a combination of procedures including pre-treatment by reductive precipitation (EPA 1640)/6020 analysis, as well as alternate methods for selenium analysis (selenium by graphite furnace atomic absorption spectrometry or hydride).

At the time that this request was received from the laboratory, the field crews were in the process of collecting Trident transition zone water samples at the Arkema site, and were immediately directed to target 620 mL for metals analyses at all remaining Arkema locations. Dilution at the laboratory may be necessary for samples collected prior to the updated volume requirements, which will affect the sample detection limits. The appropriate additional volume was collected in the peeper samples at the Arkema site, which were deployed on October 18, following the October 11 notification from the lab regarding the need for additional volume. Final detection limits, reporting limits, and analytical methods used are not yet available from the analytical laboratory.

⁵ The chain of custody was completed incorrectly for 30 cm and 90+ cm Trident samples for the RP-03-C location. Specifically, pesticides analysis was indicated (though herbicides were also circled). The lab did not recognize the conflicting direction and analyzed the samples for pesticides, consuming all sample volume collected for analysis of herbicides.

5.0 Summary of Round 2 Groundwater Pathway Assessment Sampling Activities

The objective of Round 2 transition zone water sampling was to collect and analyze samples of transition zone water to quantify concentrations of groundwater-related COIs in areas of plume discharge identified during the groundwater discharge mapping field effort. Additionally, sediment samples were collected at a subset of locations to support partitioning analysis. As described in the SAP, the following nine sites were included in the sampling effort:

- ExxonMobil Oil Terminal
- Gasco
- Siltronic
- Arkema Acid and Chlorate Plant
- Kinder Morgan Linnton Terminal
- ARCO Terminal 22T
- Rhone Poulenc (Bayer)
- Willbridge Bulk Fuels Terminal
- Gunderson.

A total of 191 transition zone water samples were successfully collected at 80 locations using the Trident probe and small-volume peepers. A total of 38 sediment samples from 34 locations were successfully collected using the power grab system. An overall summary of samples collected at each site is presented in Table 2-1. Additionally, tabular and graphical summaries of all collected samples and requested analyses are presented by site in Figures 2-1 through 2-10 and Tables 2-2 through 2-21.

The sampling program was completed between October 3 and December 2, 2005, and was conducted in close accordance with the sampling plans described in the TZW FSP documents (Integral 2005a,b,h) as well as the QAPP (Integral 2005d; Integral, in press). Deviations were primarily limited to access issues at the Gasco site and anticipated volume limitations in transition zone water sampling.

All sample analyses for this project are being conducted by CAS. Laboratory data will be provided to the Round 2 data validation contractor (EcoChem, Seattle, WA) for data review and validation.

6.0 REFERENCES

EPA. 2005. Personal communication (letter of October 13, 2005, regarding conditional approval for Round 2 Groundwater Pathway Assessment Field Sampling Plan Addendum 2). U.S. Environmental Protection Agency, Portland, OR.

Integral. 2004. Portland Harbor RI/FS Round 2 Field Sampling Plan, Groundwater Pathway Assessment Pilot Study. Prepared for the Lower Willamette Group, Portland, OR. Integral Consulting Inc., Mercer Island, WA.

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Integral. 2005b. Portland Harbor RI/FS Field Sampling Plan for Transition Zone Water Sampling: Addendum 2 Sampling Plans for Kinder Morgan Linnton, ARCO, Rhone Poulenc, Willbridge, and Gunderson. Draft. IC05-0033. Prepared for the Lower Willamette Group, Portland, OR. Integral Consulting Inc., Mercer Island, WA. *(The final revision of the September 2005 draft is anticipated in February 2006.)*

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Integral, Kennedy/Jenks, and Windward. 2005e. Portland Harbor RI/FS Groundwater Pathway Assessment Sampling and Analysis Plan. Draft. IC05-0013. Prepared for the Lower Willamette Group, Portland, OR. Integral Consulting Inc., Mercer Island, WA. *(The final revision of the April 2005 draft is anticipated in April 2006.)*

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Integral. 2005g. Portland Harbor RI/FS Groundwater Pathway Assessment Sampling and Analysis Plan Attachment 1: Field Sampling Plan Groundwater Plume Discharge Mapping. Draft. IC05-0016. Prepared for the Lower Willamette Group, Portland, OR. Integral Consulting Inc., Mercer Island, WA.

Integral. 2005h. Portland Harbor RI/FS Groundwater Pathway Assessment Sampling and Analysis Plan Attachment 2: Field Sampling Plan Transition Zone Water Sampling. Draft. IC05-0022. Prepared for the Lower Willamette Group, Portland, OR. Integral Consulting Inc., Mercer Island, WA. (*The final revision of the July 2005 draft is anticipated in February 2006.*)



Figures





Kinder Morgan Liquid Terminals 1096

RK St

Surface Sediment Texture Interpretation

- Clay
- Silt
- Sand
- Mixed Sand & Silt

Transition Zone Water Samples

- Peeper, 30 cm
- Trident, 30 cm
- Trident, 90+ cm
- Paired Trident, 30 cm and 90+ cm
- Power Grab

LEGEND

- 2003 - 5 Ft. Bathymetry (NAVD 88)
- Site Property Boundary
- Navigation Channel

0 25 50 100 Feet

FEATURE SOURCES:
Aerial Photo: Spencer B. Cross, October 2001.
Base Map features from Portland Metro's RLIS.
Channel and River Miles: Developed from US Army Corps of Engineers information.
Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.
Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Groundwater_Workplan\all_sites_Trident_FSR_200601_3.mxd)
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Figure 2-1
Portland Harbor RI/FS
Round 2 Groundwater Pathway Assessment
Transition Zone Water Field Sampling Report
Kinder Morgan Linnton Transition Zone Water and Sediment Sampling Locations

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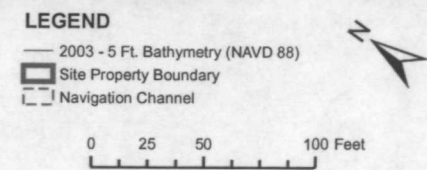
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ARCO Bulk Terminal

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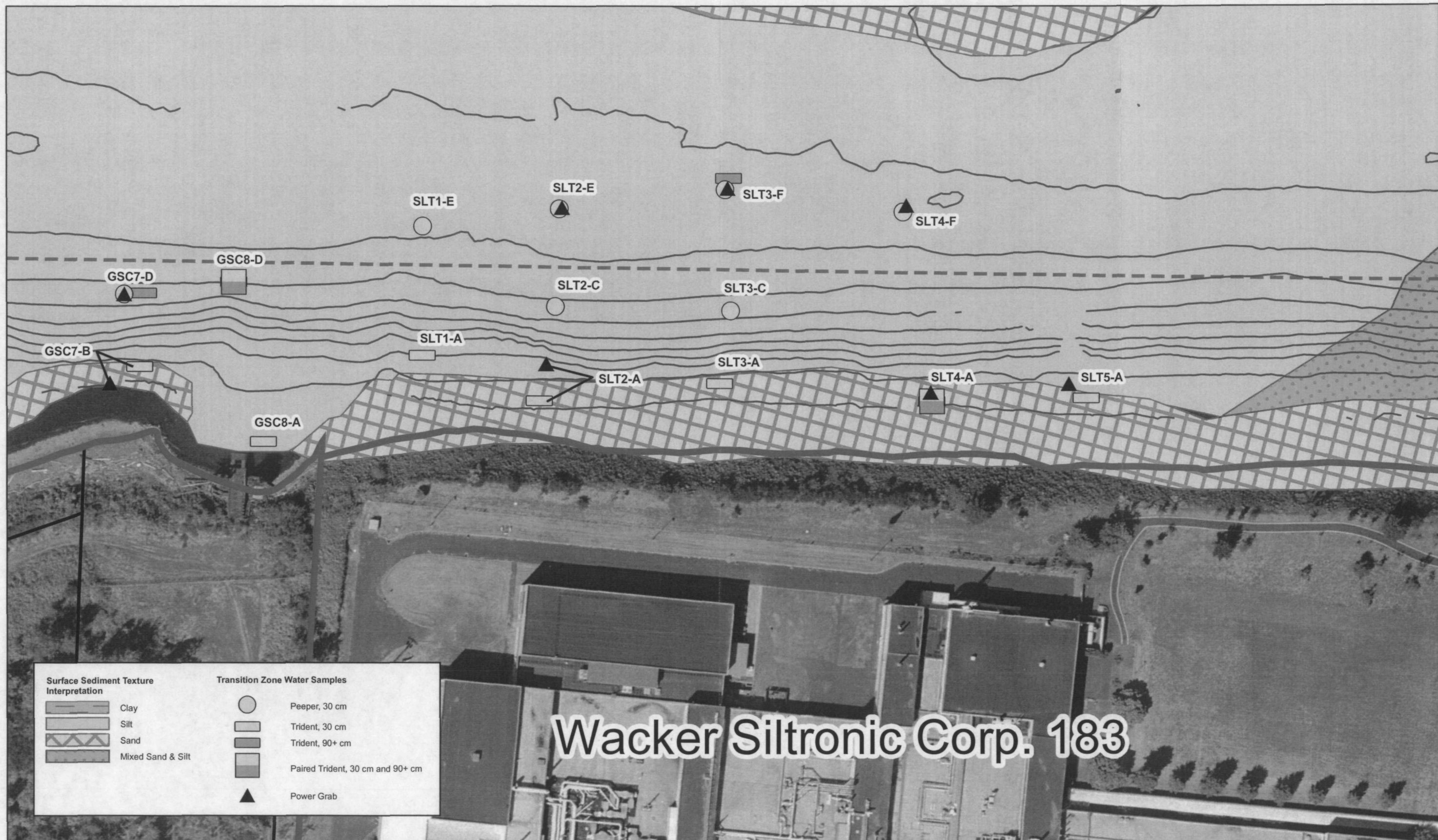
FEATURE SOURCES:
 Aerial Photo: Spencer B. Cross, October 2001.
 Base Map features from Portland Metro's RLIS.
 Channel and River Miles: Developed from US Army Corps of Engineers information.
 Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
 Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.
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Figure 2-2
 Portland Harbor RI/FS
 Round 2 Groundwater Pathway Assessment
 Transition Zone Water Field Sampling Report
 ARCO Transition Zone Water and Sediment Sampling Locations





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- 2003 - 5 Ft. Bathymetry (NAVD 88)
- Site Property Boundary
- Navigation Channel

0 25 50 100 Feet



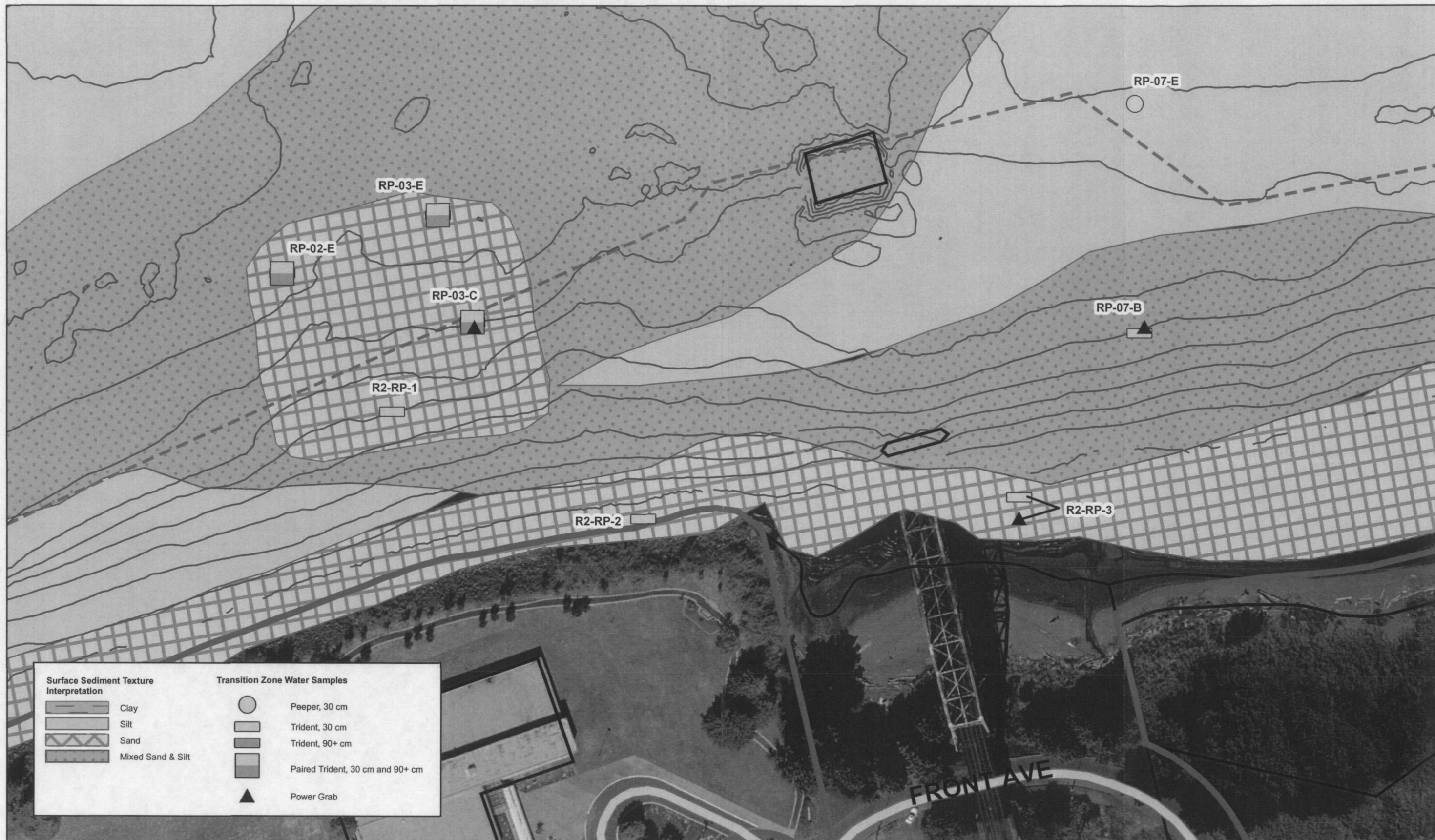
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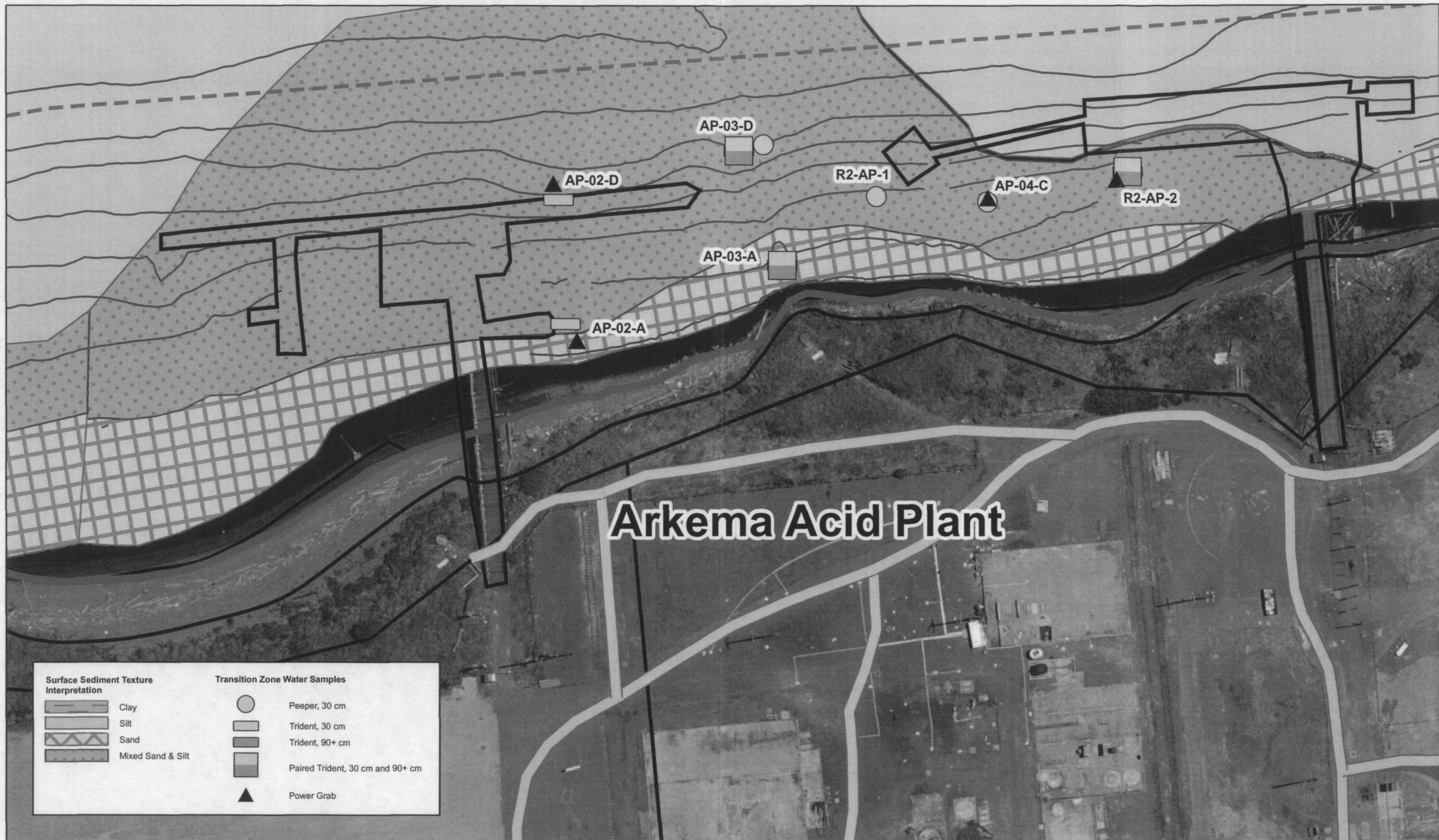
Aerial Photo: Spencer B. Cross, October 2001.
Base Map features from Portland Metro's RLIS.
Channel and River Miles: Developed from US Army Corps of Engineers information.
Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.
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Figure 2-4
Round 2 Groundwater Pathway Assessment
Transition Zone Water Field Sampling Report
Siltronic Transition Zone Water and Sediment Sampling Locations





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- 2003 - 5 Ft. Bathymetry (NAVD 88)
- ▬ Site Property Boundary
- - - Navigation Channel

0 25 50 100 Feet

FEATURE SOURCES:

Aerial Photo: Spencer B. Cross, October 2001.
Base Map features from Portland Metro's RLIS.
Channel and River Miles: Developed from US Army Corps of Engineers information.
Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.
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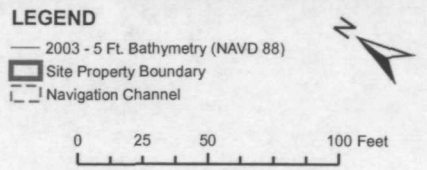
Figure 2-6
Portland Harbor RI/FS
Round 2 Groundwater Pathway Assessment
Transition Zone Water Field Sampling Report
Arkema Acid Plant Transition Zone Water and Sediment Sampling Locations



Chlorate Plant - Arkema

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FEATURE SOURCES:
 Aerial Photo: Spencer B. Cross, October 2001.
 Base Map features from Portland Metro's RLIS.
 Channel and River Miles: Developed from US Army Corps of Engineers information.
 Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
 Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.
 Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Groundwater_Workplan\all_sites_Trident_FSR_200601_3.mxd)
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Figure 2-7
 Portland Harbor RI/FS
 Round 2 Groundwater Pathway Assessment
 Transition Zone Water Field Sampling Report
 Arkema Chlorate Plant Transition Zone Water and Sediment Sampling Locations



Exxon Mobil Oil Terminal

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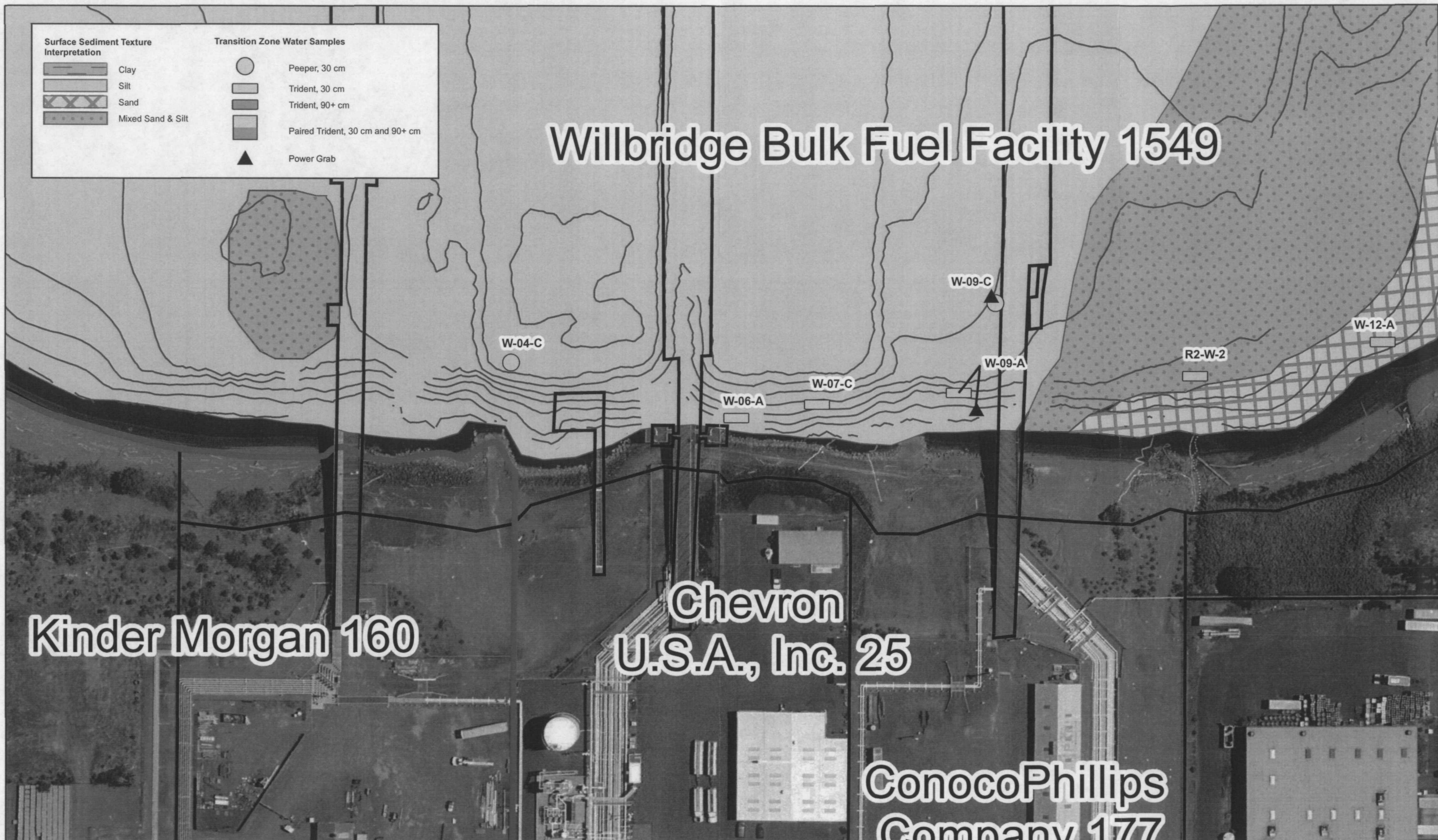
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Figure 2-8
 Portland Harbor RI/FS
 Round 2 Groundwater Pathway Assessment
 Transition Zone Water Field Sampling Report
 ExxonMobil Transition Zone Water and Sediment Sampling Locations

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0 25 50 100 Feet



Surface Sediment Texture Interpretation		Transition Zone Water Samples	
[Pattern]	Clay	[Symbol]	Peeper, 30 cm
[Pattern]	Silt	[Symbol]	Trident, 30 cm
[Pattern]	Sand	[Symbol]	Trident, 90+ cm
[Pattern]	Mixed Sand & Silt	[Symbol]	Paired Trident, 30 cm and 90+ cm
		[Symbol]	Power Grab

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- 2003 - 5 Ft. Bathymetry (NAVD 88)
- [Line] Site Property Boundary
- [Line] Navigation Channel

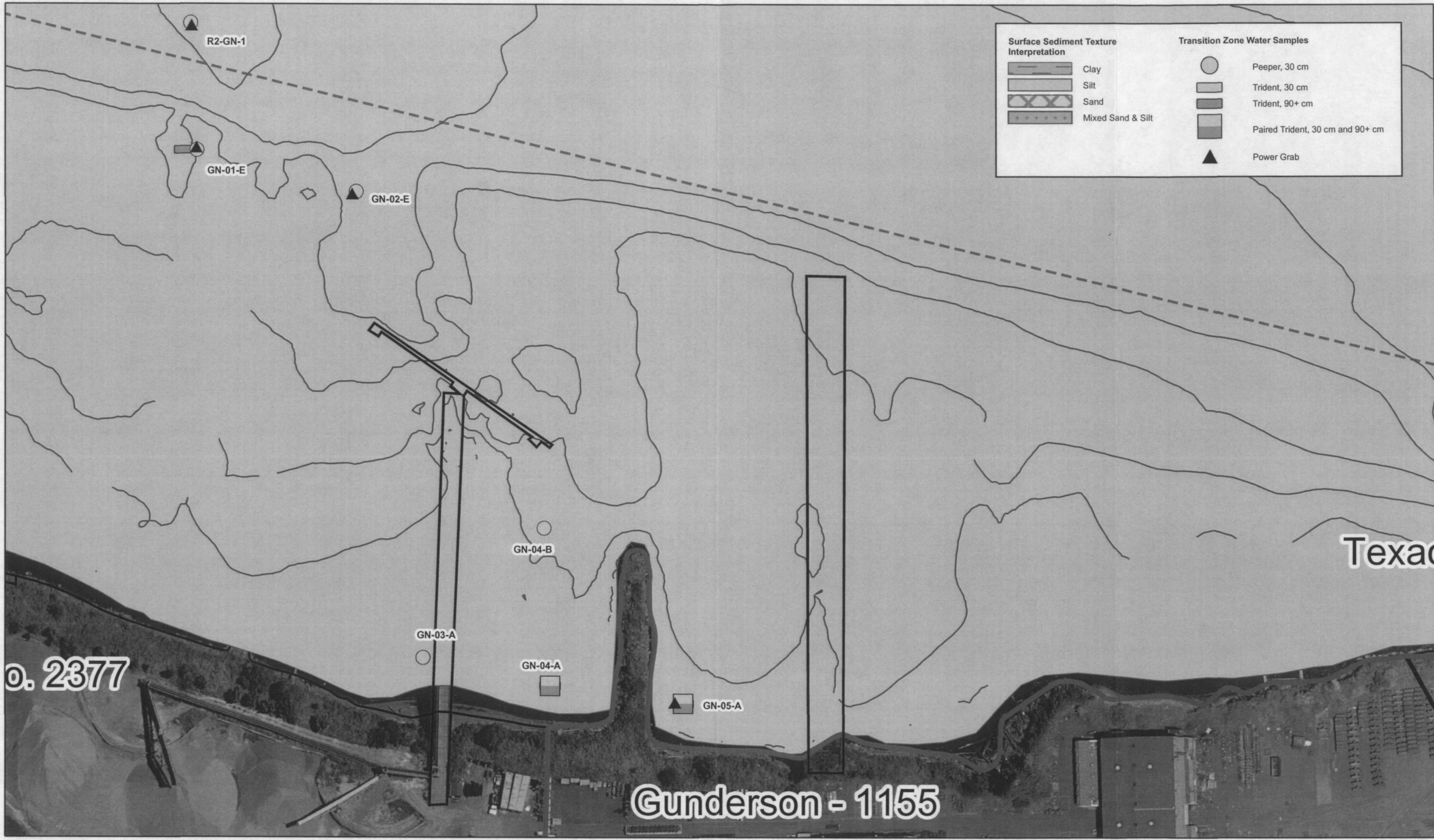
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FEATURE SOURCES:
 Aerial Photo: Spencer B. Cross, October 2001.
 Base Map features from Portland Metro's RLIS.
 Channel and River Miles: Developed from US Army Corps of Engineers information.
 Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
 Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.
 Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Groundwater_Workplan\all_sites_Trident_FSR_200601_3.mxd)
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Figure 2-9
 Portland Harbor RI/FS
 Round 2 Groundwater Pathway Assessment
 Transition Zone Water Field Sampling Report
 Willbridge Transition Zone Water and Sediment Sampling Locations



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— 2003 - 5 Ft. Bathymetry (NAVD 88)

□ Site Property Boundary

□ Navigation Channel

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FEATURE SOURCES:

Aerial Photo: Spencer B. Cross, October 2001.

Base Map features from Portland Metro's RLIS.

Channel and River Miles: Developed from US Army Corps of Engineers information.

Docks & In-water Structures: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.

Point KM4-A: 60 cm temperature and conductivity readings could not be collected with the Trident probe due to probe refusal at 30 cm.

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Figure 2-10

Portland Harbor RI/FS

Round 2 Groundwater Pathway Assessment

Transition Zone Water Field Sampling Report

Gunderson Transition Zone Water and Sediment Sampling Locations

Tables



Table 2-1. Summary of Transition Zone Water and Sediment Sample Counts – All Sites.

			Original Samples				Replicate Samples				Additional Volume for Lab QC ¹		Equipment
Site	Total No. of Locations Sampled	Filtration	Transition Zone Water			Sediment	Transition Zone Water			Sediment	Transition Zone Water	Sediment	Rinsates
			Trident 30 cm	Trident 90+ cm	Small-volume Peeper	Power Grab	Trident 30 cm	Trident 90+ cm	Small-volume Peeper	Power Grab	Trident 30 cm	Power Grab	Trident ²
ExxonMobil	10	unfiltered	10	3	0	2	1	1	0	0	1	0	1
		filtered	10	3	--	--	1	1	--	--	--	--	1
Gasco	10	unfiltered	4	2	2	3	1	0	1	1	1	0	1
		filtered	3	0	--	--	1	0	--	--	--	--	1
Siltronic	11	unfiltered	5	2	6	6	1	0	1	0	1	1	1
		filtered	5	1	--	--	1	0	--	--	1	--	1
Arkema Acid Plant	7	unfiltered	5	3	3	4	1	0	1	1	1	1	1
		filtered	3	0	--	--	1	0	--	--	--	--	1
Arkema Chlorate Plant	7	unfiltered	5	3	3	4	1	0	1	0	0	0	0 ³
		filtered	5	0	--	--	1	0	--	--	--	--	0 ³
Kinder Morgan Linnton Terminal	6	unfiltered	3	1	4	2	1	0	1	0	1	1	1
		filtered	2	0	--	--	1	0	--	--	--	--	1
ARCO	7	unfiltered	6	2	1	4	1	1	1	1	1	0	1
		filtered	6	2	--	--	1	1	--	--	--	--	1
Rhône Poulenc	8	unfiltered	6	3	1	3	1	0	1	0	1	0	1
		filtered	6	2	--	--	1	0	--	--	--	--	1
Willbridge	7	unfiltered	5	0	2	2	1	0	1	0	1	0	1
		filtered	5	0	--	--	1	0	--	--	--	--	1
Gunderson	7	unfiltered	2	3	5	4	1	1	1	1	1	1	1
		filtered	2	2	--	--	0	1	--	--	--	--	1

Notes:

-- Not applicable

¹ Three times the minimum sample volume was collected for lab QA/QC at these locations.

² One rinsate sample, representative of all sites, was collected from new peepers using DI water in the field laboratory. See Section 3.5 for additional discussion. No Power-grab rinsates were collected as specified in the TZW FSP (Integral 2005h). See Section 3.5 for additional details.

³ Equipment rinsate blanks and additional lab QA/QC volume samples representative of both the Arkema Acid Plant and Chlorate Plant were collected at the Acid Plant.

Table 2-2. Transition Zone Water and Bulk Sediment Sample Summary - Kinder Morgan Linnton Terminal

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
R2-KM-1	Trident	LWG2-T30-R2KM1	30	original	unfiltered	water	10/19/2005	11:20	45.60392	-122.78602	1	120	gravely sand
	Trident	LWG2-T30-R2KM1-Filt	30	original	filtered	water	10/19/2005	12:00	45.60392	-122.78602	1	120	gravely sand
	Trident	LWG2-T30-R2KM1-D	30	replicate	unfiltered	water	10/19/2005	12:00	45.60392	-122.78602	1	120	gravely sand
	Trident	LWG2-T30-R2KM1-D-Filt ¹	30	replicate	filtered	water	10/19/2005	12:00	45.60392	-122.78602	1	120	gravely sand
R2-KM-2	Trident	LWG2-T30-R2KM2 ²	30	original	unfiltered	water	10/18/2005	14:40	45.60387	-122.78543	36	40	soft silt
	Trident	LWG2-T90-R2KM2 ²	150	original	unfiltered	water	10/18/2005	13:35	45.60387	-122.78543	36	40	soft silt
	Peeper	LWG2-P-R2KM2	0 - 38	original	unfiltered	water	11/30/2005	--	45.60388	-122.78537	--	--	--
	Power Grab	LWG2-PG-R2KM2	0 - 30	original	--	sediment	12/1/2005	9:46	45.63388 ⁴	-122.78537 ⁴	38	--	silt with trace sand
KM-06-A	Peeper	LWG2-P-KM6A	0 - 38	original	unfiltered	water	11/30/2005	--	7617108.01 ⁵	714650.6 ⁵	--	--	--
KM-08-A	Trident	LWG2-T30-KM8A	30	original	unfiltered	water	10/19/2005	10:45	45.60373	-122.78585	2	100	sand surface, sandy silt/clay below
	Trident	LWG2-T30-KM8A-Filt	30	original	filtered	water	10/19/2005	10:45	45.60373	-122.78585	2	100	sand surface, sandy silt/clay below
	Trident	Not sampled ³	90+	--	--	--	--	--	--	--	--	--	sandy silt/clay
	Power Grab	LWG2-PG-KM8A	0 - 20	original	--	sediment	12/1/2005	10:40	45.60373	-122.78585	0	--	sand gravel and rock (rip rap) surface, sand gravel and silt below
KM-10-A	Peeper	LWG2-P-KM10A	0 - 38	original	unfiltered	water	11/30/2005	--	45.60343	-122.78547	--	--	sand
KM-11-B	Peeper	LWG2-P-KM11B	0 - 38	original	unfiltered	water	11/29/2005	--	45.60330	-122.78523	--	--	--
	Peeper	LWG2-P-KM11B_2	0 - 38	replicate	unfiltered	water	11/30/2005	--	45.60330	-122.78523	--	--	--
RINSE-KM	Trident	LWG2-RINSE-KM	--	EB	unfiltered	water	10/19/2005	8:50	--	--	--	--	--
	Trident	LWG2-RINSE-KM-Filt	--	EB	filtered	water	10/19/2005	8:50	--	--	--	--	--

Notes:

EB Equipment blank
-- Not applicable

¹ Location R2-KM-1 Trident 90+ cm replicate filtered TPH_{DRO/RRO} sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location R2-KM-2 Trident 30 cm samples for metals, PAH, TPH_{DRO/RRO}, and conventionals, as well as 90+ cm samples for PAH, TPH_{DRO/RRO}, and conventionals, were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Filtered samples were not collected for the same reason. Note: filtered transition zone water samples were not required in the Round 2 study.

³ Location KM-08-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Power grab target coordinates shown here; actual coordinates were recorded incorrectly in the field.

⁵ Oregon State Plane HARN international foot coordinates.

Table 2-3. Transition Zone Water and Bulk Sediment Sample Analyses - Kinder Morgan Linnton Terminal.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																Additional Lab QC Volume Collected ²	
							TZW Analyte Groups						Sediment Analyte Groups											
							Metals	VOCs	PAHs	TPH-gas	TPH _{DRO/RRO}	Conventionals ¹	Metals	VOCs	TPH-gas	TPH _{DRO}	Grain Size	Atterberg & SG	Total Sulfides	Ammonia	SVOCs	TOC		
R2-KM-1	Trident	LWG2-T30-R2KM1	30	original	unfiltered	water	X	X	X	X	X	X											X	
	Trident	LWG2-T30-R2KM1-Filt	30	original	filtered	water	X		X		X													
	Trident	LWG2-T30-R2KM1-D	30	replicate	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-R2KM1-D-Filt ³	30	replicate	filtered	water	X		X		NC													
R2-KM-2	Trident	LWG2-T30-R2KM2 ⁴	30	original	unfiltered	water	NC	X	NC	X	NC	NC												
	Trident	LWG2-T90-R2KM2 ⁴	150	original	unfiltered	water	X	X	NC	X	NC	NC												
	Peeper	LWG2-P-R2KM2	0 - 38	original	unfiltered	water	X	X	X	X	X	X												
	Power Grab	LWG2-PG-R2KM2	0 - 30	original	--	sediment							X	X	X	X	X	X	X	X	X	X		
KM-06-A	Peeper	LWG2-P-KM6A	0 - 38	original	unfiltered	water	X	X	X	X	X	X												
KM-08-A	Trident	LWG2-T30-KM8A	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-KM8A-Filt	30	original	filtered	water	X		X		X													
	Trident	Not sampled ⁵	90+	--	--	--	NC	NC	NC	NC	NC	NC												
	Power Grab	LWG2-PG-KM8A	0 - 20	original	--	sediment							X	X	X	X	X	X	X	X	X			
KM-10-A	Peeper	LWG-2-P-KM10A	0 - 38	original	unfiltered	water	X	X	X	X	X	X												
KM-11-B	Peeper	LWG2-P-KM11B	0 - 38	original	unfiltered	water	X	X	X	X	X	X												
	Peeper	LWG2-P-KM11B 2	0 - 38	replicate	unfiltered	water	X	X	X	X	X	X												
RINSE-KM	Trident	LWG2-RINSE-KM	--	EB	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-RINSE-KM-Filt	--	EB	filtered	water	X		X	X														

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

EB Equipment blank

-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location R2-KM-1 Trident 90+ cm replicate filtered TPH_{DRO/RRO} sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location R2-KM-2 Trident 30 cm samples for metals, PAH, TPH_{DRO/RRO}, and conventionals, as well as 90+ cm samples for PAH, TPH_{DRO/RRO}, and conventionals, were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Filtered samples were not collected for the same reason. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Location KM-08-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-4. Transition Zone Water and Bulk Sediment Sample Summary - ARCO.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
AR-01-A	Trident	LWG2-T30-AR1A	30	original	unfiltered	water	10/13/2005	13:10	45.59615	-122.78028	0	100	sand with gravel
	Trident	LWG2-T30-AR1A-Filt	30	original	filtered	water	10/13/2005	13:10	45.59615	-122.78028	0	100	sand with gravel
	Trident	LWG2-T30-AR1A-D	30	replicate	unfiltered	water	10/13/2005	13:50	45.59615	-122.78028	0	100	sand with gravel
	Trident	LWG2-T30-AR1A-D-Filt	30	replicate	filtered	water	10/13/2005	13:50	45.59615	-122.78028	0	100	sand with gravel
	Trident	LWG2-T90-AR1A	150	original	unfiltered	water	10/13/2005	13:20	45.59615	-122.78028	0	60	sandy silt 2' to 4'; > 4' clay with sand
	Trident	LWG2-T90-AR1A-Filt	150	original	filtered	water	10/13/2005	13:20	45.59615	-122.78028	0	60	sandy silt 2' to 4'; > 4' clay with sand
AR-02-A	Trident	LWG2-T30-AR2A	30	original	unfiltered	water	10/13/2005	11:00	45.59598	-122.77998	1	100	silty sand with gravel
	Trident	LWG2-T30-AR2A-Filt	30	original	filtered	water	10/13/2005	11:00	45.59598	-122.77998	1	100	silty sand with gravel
	Trident	Not sampled ¹	90+	--	--	water	--	--	--	--	--	--	silt
	Power Grab	LWG2-PG-AR2A	0 - 23	original	--	sediment	11/29/2005	9:25	45.595920	-122.780000	3	--	sand with gravel and rock (rip rap) surface, silt with trace sand below
AR-04-B	Peeper	LWG2-P-AR04B ²	0 - 25	original	unfiltered	water	11/15/2005	--	45.595730	-122.779870	--	--	--
	Peeper	LWG2-P-AR04B 2 ²	0 - 25	replicate	unfiltered	water	11/15/2005	--	45.595730	-122.779870	--	--	--
R2-AR-1	Trident	LWG2-T30-R2AR1	30	original	unfiltered	water	10/17/2005	11:30	45.59545	-122.77952	6	100	sand
	Trident	LWG2-T30-R2AR1-Filt	30	original	filtered	water	10/17/2005	11:30	45.59545	-122.77952	6	100	sand
	Power Grab	LWG2-PG-R2AR1	0 - 24	original	--	sediment	11/29/2005	10:19	45.595520	-122.779590	0	--	sand with gravel and silt
	Power Grab	LWG2-PG-R2AR1-2	0 - 24	replicate	--	sediment	11/29/2005	10:38	45.595920	-122.779605	0	--	sand with gravel and silt
R2-AR-2	Trident	LWG2-T30-R2AR2	30	original	unfiltered	water	10/17/2005	14:20	45.59503	-122.77905	8	100	sand with silt surface, silt below
	Trident	LWG2-T30-R2AR2-Filt	30	original	filtered	water	10/17/2005	14:20	45.59503	-122.77905	8	100	sand with silt surface, silt below
	Trident	LWG2-T90-R2AR2	90	original	unfiltered	water	10/17/2005	14:30	45.59503	-122.77905	8	80	sand with silt surface, silt below
	Trident	LWG2-T90-R2AR2-Filt	90	original	filtered	water	10/17/2005	14:30	45.59503	-122.77905	8	80	sand with silt surface, silt below
	Trident	LWG2-T90-R2AR2-D	90	replicate	unfiltered	water	10/17/2005	14:30	45.59503	-122.77905	8	80	sand with silt surface, silt below
	Trident	LWG2-T90-R2AR2-D-Filt	90	replicate	filtered	water	10/17/2005	14:30	45.59503	-122.77905	8	80	sand with silt surface, silt below
	Power Grab	LWG2-PG-R2AR2	0 - 19	original	--	sediment	11/29/2005	11:06	45.595040	-122.779020	4	--	sand with silt surface, silt below
R2-AR-3	Trident	LWG2-T30-R2AR3	30	original	unfiltered	water	10/18/2005	9:50	45.599452	-122.77865	10	100	sand with rock (rip rap)
	Trident	LWG2-T30-R2AR3-Filt	30	original	filtered	water	10/18/2005	9:50	45.599452	-122.77865	10	100	sand with rock (rip rap)
R2-AR-4	Trident	LWG2-T30-R2AR4	30	original	unfiltered	water	10/18/2005	11:35	45.59425 ³	-122.77830 ³	4.5	110	sand
	Trident	LWG2-T30-R2AR4-Filt	30	original	filtered	water	10/18/2005	11:35	45.59425 ³	-122.77830 ³	4.5	110	sand
	Power Grab	LWG2-PG-R2AR4	0 - 18	original	--	sediment	11/29/2005	12:03	45.594200	-122.778260	3.5	--	sand with gravel
RINSE-AR	Trident	LWG2-RINSE-AR	--	EB	unfiltered	water	10/17/2005	9:30	--	--	--	--	--
	Trident	LWG2-RINSE-AR-Filt	--	EB	filtered	water	10/17/2005	9:30	--	--	--	--	--

Notes:

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-- Not applicable

¹ Location AR-02-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location AR-04-B peeper original and replicate conventionals samples were not collected due to exposed (above mudline) cells in upper third of the samplers. These cells were not used for sampling.

³ Location R2-AR-4 Trident target coordinates shown here; actual coordinates were recorded incorrectly in the field.

Table 2-5. Transition Zone Water and Bulk Sediment Sample Analyses - ARCO.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																Additional Lab QC Volume Collected ²
							TZW Analyte Groups						Sediment Analyte Groups										
							Metals	VOCs	PAHs	TPH-gas	TPH _{1600/800}	Conventional ¹	Metals	VOCs	TPH-gas	TPH _{DRO}	Grain Size	Atterberg & SG	Total Sulfides	Ammonia	SVOCs	TOC	
AR-01-A	Trident	LWG2-T30-AR1A	30	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T30-AR1A-Filt	30	original	filtered	water	X		X		X												
	Trident	LWG2-T30-AR1A-D	30	replicate	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T30-AR1A-D-Filt	30	replicate	filtered	water	X		X		X												
	Trident	LWG2-T90-AR1A	150	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T90-AR1A-Filt	150	original	filtered	water	X		X		X												
AR-02-A	Trident	LWG2-T30-AR2A	30	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T30-AR2A-Filt	30	original	filtered	water	X		X		X												
	Trident	Not sampled ³	90+	--	--	water	NC	NC	NC	NC	NC	NC											
	Power Grab	LWG2-PG-AR2A	0 - 23	original	--	sediment							X	X	X	X	X	X	X	X	X	X	
AR-04-B	Peeper	LWG2-P-AR04B ⁴	0 - 25	original	unfiltered	water	X	X	X	X	X	NC											
	Peeper	LWG2-P-AR04B 2 ⁴	0 - 25	replicate	unfiltered	water	X	X	X	X	X	NC											
R2-AR-1	Trident	LWG2-T30-R2AR1	30	original	unfiltered	water	X	X	X	X	X	X											X
	Trident	LWG2-T30-R2AR1-Filt	30	original	filtered	water	X		X		X												
	Power Grab	LWG2-PG-R2AR1	0 - 24	original	--	sediment							X	X	X	X	X	X	X	X	X	X	
	Power Grab	LWG2-PG-R2AR1-2	0 - 24	replicate	--	sediment							X	X	X	X	X	X	X	X	X	X	
R2-AR-2	Trident	LWG2-T30-R2AR2	30	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T30-R2AR2-Filt	30	original	filtered	water	X		X		X												
	Trident	LWG2-T90-R2AR2	90	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T90-R2AR2-Filt	90	original	filtered	water	X		X		X												
	Trident	LWG2-T90-R2AR2-D	90	replicate	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T90-R2AR2-D-Filt	90	replicate	filtered	water	X		X		X												
	Power Grab	LWG2-PG-R2AR2	0 - 19	original	--	sediment							X	X	X	X	X	X	X	X	X	X	
R2-AR-3	Trident	LWG2-T30-R2AR3	30	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T30-R2AR3-Filt	30	original	filtered	water	X		X		X												
R2-AR-4	Trident	LWG2-T30-R2AR4	30	original	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-T30-R2AR4-Filt	30	original	filtered	water	X		X		X												
	Power Grab	LWG2-PG-R2AR4	0 - 18	original	--	sediment							X	X	X	X	X	X	X	X	X	X	
RINSE-AR	Trident	LWG2-RINSE-AR	--	EB	unfiltered	water	X	X	X	X	X	X											
	Trident	LWG2-RINSE-AR-Filt	--	EB	filtered	water	X		X		X												

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

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-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location AR-02-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location AR-04-B peeper original and replicate conventional samples were not collected due to exposed (above mudline) cells in upper third of the samplers. These cells were not used for sampling.

Table 2-6. Transition Zone Water and Bulk Sediment Sample Summary - Gasco.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
GSC-01-B	Peeper	LWG2-P-GS1B	0 - 38	original	unfiltered	water	11/29/2005	--	45.581230	-122.761420	--	--	gravel, clay-like below
GSC-02-A	Trident	LWG2-T30-GS2A	30	original	unfiltered	water	10/25/2005	14:15	45.580750	-122.760650	3.5	80	rock (rip rap) surface, silt below
	Trident	LWG2-T30-GS2A-Filt	30	original	filtered	water	10/25/2005	14:15	45.580750	-122.760650	3.5	80	rock (rip rap) surface, silt below
	Trident	LWG2-T30-GS2A-D	30	replicate	unfiltered	water	10/25/2005	14:15	45.580750	-122.760650	3.5	80	rock (rip rap) surface, silt below
	Trident	LWG2-T30-GS2A-D-Filt	30	replicate	filtered	water	10/25/2005	14:15	45.580750	-122.760650	3.5	80	rock (rip rap) surface, silt below
GSC-04-A	Trident	Not Sampled ¹	30	--	--	water	--	--	--	--	--	--	--
	Trident	Not Sampled ¹	90+	--	--	water	--	--	--	--	--	--	--
	Power Grab	LWG2-PG-GS4A	0 - 26	original	--	sediment	12/1/2005	12:43	45.580190	-122.758890	4	--	sand with silt
	Power Grab	LWG2-PG-GS4A-2	0 - 26	replicate	--	sediment	12/1/2005	13:06	45.580220	-122.758920	4	--	sand with silt
GSC-05-A	Trident	Not Sampled ¹	30	--	--	--	--	--	--	--	--	--	--
	Trident	Not Sampled ¹	90+	--	--	--	--	--	--	--	--	--	--
GSC-05-B	Trident	Not Sampled ¹	30	--	--	--	--	--	--	--	--	--	--
GSC-06-A	Trident	Not Sampled ¹	30	--	--	--	--	--	--	--	--	--	--
GSC-07-B	Trident	LWG2-T30-GS7B	30	original	unfiltered	water	10/25/2005	12:00	45.579430	-122.756650	3.2	100	sandy with some silt
	Trident	Not Sampled ²	90+	--	--	--	--	--	--	--	--	--	sandy with some silt
	Power Grab	LWG2-PG-GS7B	0 - 24	original	--	sediment	12/1/2005	13:40	45.579430	-122.756670	5	--	sand with gravel surface, sand with silt below
GSC-07-D	Trident	LWG2-T90-GS7D ³	150	original	unfiltered	water	10/25/2005	10:40	45.579600	-122.756480	38.2	40	soft silt
	Peeper	LWG2-P-GS7D	0 - 38	original	unfiltered	water	11/29/2005	--	45.579600	-122.756480	--	--	--
	Peeper	LWG2-P-GS7D_2	0 - 38	replicate	unfiltered	water	11/29/2005	--	45.579600	-122.756480	--	--	--
	Power Grab	LWG2-PG-GS7D	0 - 30	original	--	sediment	12/1/2005	14:01	45.579600	-122.756480	38	--	0 - 8" silt with sand, sand with silt below
GSC-08-A	Trident	LWG2-T30-GS8A	30	original	unfiltered	water	10/24/2005	11:00	45.579131	-122.756300	4.2	120	gravely sand surface, silt below
	Trident	LWG2-T30-GS8A-Filt	30	original	filtered	water	10/24/2005	11:00	45.579131	-122.756300	4.2	120	gravely sand surface, silt below
GSC-08-D	Trident	LWG2-T30-GS8D	30	original	unfiltered	water	10/24/2005	13:15	45.579500	-122.756130	33.1	100	gravely sand surface, silt below
	Trident	LWG2-T30-GS8D-Filt	30	original	filtered	water	10/24/2005	13:15	45.579500	-122.756130	33.1	100	gravely sand surface, silt below
	Trident	LWG2-T90-GS8D ⁴	150	original	unfiltered	water	10/24/2005	13:30	45.579500	-122.756130	33.1	60	gravely sand surface, silt below
RINSE-GS	Trident	LWG2-RINSE-GS	--	EB	unfiltered	water	10/25/2005	8:30	--	--	--	--	--
	Trident	LWG2-RINSE-GS-Filt	--	EB	filtered	water	10/25/2005	8:30	--	--	--	--	--

Notes:

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-- Not applicable

¹ Locations GSC-04-A, GSC-05-A, GSC-05-B, and GSC-06-A Trident samples were not collected due to inability to access the location because of concurrent in-water remedial work being performed at the Gasco site.

² Location GSC-07-B Trident 90+ cm sample was not collected due to repeated clogging of the Trident sample intake with tar sediment.

³ Location GSC-07-D Trident 90+ cm unfiltered metals, PAHs, TPH_{PRO/RO}, Cyanide, and conventionals were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Filtered samples were also not collected for this reason. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location GSC-08-D Trident 90+ cm unfiltered metals, PAHs, TPH_{PRO/RO}, Cyanide, and conventionals were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment.

Table 2-7. Transition Zone Water and Bulk Sediment Sample Analyses - Gasco.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																		Additional Lab QC Volume Collected ²
							TZW Analyte Groups							Sediment Analyte Groups											
							Metals	VOCs	PAHs	TPH-gas	TPH _{DRO/RO}	Cyanide	Conventionals ¹	Metals	VOCs	TPH-gas	TPH _{DRO}	Cyanide	Grain Size	Atterberg & SG	Total Sulfides	Ammonia	SVOCs	Dioxins/furans	
GSC-01-B	Peeper	LWG2-P-GS1B	0 -38	original	unfiltered	water	X	X	X	X	X	X	X												
GSC-02-A	Trident	LWG2-T30-GS2A	30	original	unfiltered	water	X	X	X	X	X	X	X												
	Trident	LWG2-T30-GS2A-Filt	30	original	filtered	water	X		X		X														
	Trident	LWG2-T30-GS2A-D	30	replicate	unfiltered	water	X	X	X	X	X	X	X												
	Trident	LWG2-T30-GS2A-D-Filt	30	replicate	filtered	water	X		X		X														
GSC-04-A	Trident	Not Sampled ³	30	--	--	--	NC	NC	NC	NC	NC	NC	NC												
	Trident	Not Sampled ³	90+	--	--	--	NC	NC	NC	NC	NC	NC	NC												
	Power Grab	LWG2-PG-GS4A	0 - 26	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X	
	Power Grab	LWG2-PG-GS4A-2	0 - 26	replicate	--	sediment								X	X	X	X	X	X	X	X	X	X	X	
GSC-05-A	Trident	Not Sampled ³	30	--	--	--	NC	NC	NC	NC	NC	NC	NC												
	Trident	Not Sampled ³	90+	--	--	--	NC	NC	NC	NC	NC	NC	NC												
GSC-05-B	Trident	Not Sampled ³	30	--	--	--	NC	NC	NC	NC	NC	NC	NC												
GSC-06-A	Trident	Not Sampled ³	30	--	--	--	NC	NC	NC	NC	NC	NC	NC												
GSC-07-B	Trident	LWG2-T30-GS7B	30	original	unfiltered	water	X	X	X	X	X	X	X												
	Trident	Not Sampled ⁴	90+	--	--	--	NC	NC	NC	NC	NC	NC	NC												
	Power Grab	LWG2-PG-GS7B	0 - 24	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X	
GSC-07-D	Trident	LWG2-T90-GS7D ⁵	150	original	unfiltered	water	NC	X	NC	X	NC	NC	NC												
	Peeper	LWG-P-GS7D	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X												
	Peeper	LWG-P-GS7D_2	0 - 38	replicate	unfiltered	water	X	X	X	X	X	X	X												
	Power Grab	LWG2-PG-GS7D	0 - 30	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X	
GSC-08-A	Trident	LWG2-T30-GS8A	30	original	unfiltered	water	X	X	X	X	X	X	X												X
	Trident	LWG2-T30-GS8A-Filt	30	original	filtered	water	X		X		X														
GSC-08-D	Trident	LWG2-T30-GS8D	30	original	unfiltered	water	X	X	X	X	X	X	X												
	Trident	LWG2-T30-GS8D-Filt	30	original	filtered	water	X		X		X														
	Trident	LWG2-T90-GS8D ⁶	150	original	unfiltered	water	X	X	X	X	X	X	X												
RINSE-GS	Trident	LWG2-RINSE-GS	--	EB	unfiltered	water	X	X	X	X	X	X	X												
	Trident	LWG2-RINSE-GS-Filt	--	EB	filtered	water	X		X		X														

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

EB Equipment blank

-- Not applicable

¹ Conventional analytes include Cl, SO4, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Locations GSC-04-A, GSC-05-A, GSC-05-B, and GSC-06-A Trident samples were not collected due to inability to access the location because of concurrent in-water remedial work being performed at the Gasco site.

⁴ Location GSC-07-B Trident 90+ cm sample was not collected due to repeated clogging of the Trident sample intake with tar sediment.

⁵ Location GSC-07-D Trident 90+ cm unfiltered metals, PAHs, TPH_{DRO/RO}, Cyanide, and conventionals were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Filtered samples were also not collected for this reason. Note: filtered transition zone water samples were not required in the Round 2 study.

⁶

Location GSC-08-D Trident 90+ cm unfiltered metals, PAHs, TPH_{DRO/RO}, Cyanide, and conventionals were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment.

Table 2-8. Transition Zone Water and Bulk Sediment Sample Summary - Siltronic.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
SLT-01-A	Trident	LWG2-T30-SL1A	30	original	unfiltered	water	10/7/2005	14:30	45.57913	-122.75568	5.6	80	sand
	Trident	LWG2-T30-SL1A-Filt	30	original	filtered	water	10/7/2005	14:30	45.57913	-122.75568	5.6	80	sand
SLT-01-E	Peeper	LWG2-P-SLT1E	0 - 38	original	unfiltered	water	11/15/2005	--	45.579400	-122.755470	--	--	--
SLT-02-A	Trident	LWG2-T30-SL2A	30	original	unfiltered	water	10/7/2005	13:10	45.57890	-122.75540	7.2	100	silty sand
	Trident	LWG2-T30-SL2A-Filt	30	original	filtered	water	10/7/2005	13:10	45.57890	-122.75540	7.2	100	silty sand
	Trident	Not Sampled ¹	90+	--	--	--	--	13:10	45.57890	-122.75540	--	--	silt
	Power Grab	LWG2-PG-SL2A	0 - 29	original	--	sediment	11/29/2005	13:33	45.578970	-122.755320	15	--	silt with sand
SLT-02-C	Peeper	LWG2-P-SLT2C	0 - 38	original	unfiltered	water	11/16/2005	--	45.579080	-122.755200	--	--	--
SLT-02-E	Peeper	LWG2-P-SLT2E	0 - 38	original	unfiltered	water	11/16/2005	--	45.579280	-122.755030	--	--	--
	Power Grab	LWG2-PG-SL2E	0 - 21	original	--	sediment	11/29/2005	13:02	45.579280	-122.755020	47.5	--	silt with sand and trace gravel surface, silt with sand below
SLT-03-A	Trident	LWG2-T30-SL3A	30	original	unfiltered	water	10/7/2005	10:20	45.57873	-122.75483	3.9	100	firm sand
	Trident	LWG2-T30-SL3A-Filt	30	original	filtered	water	10/7/2005	10:20	45.57873	-122.75483	3.9	100	firm sand
	Trident	LWG2-T30-SL3A-D	30	replicate	unfiltered	water	10/7/2005	10:20	45.57873	-122.75483	3.9	100	firm sand
	Trident	LWG2-T30-SL3A-D-Filt	30	replicate	filtered	water	10/7/2005	10:20	45.57873	-122.75483	3.9	100	firm sand
SLT-03-C	Peeper	LWG2-P-SLT3C	0 - 38	original	unfiltered	water	11/17/2005	--	45.578870	-122.754680	--	--	--
SLT-03-F	Trident	LWG2-T90-SL3F ²	120	original	unfiltered	water	10/8/2005	10:20	45.57915	-122.75447	47.6	20	silt
	Peeper	LWG2-P-SLT3F	0 - 38	original	unfiltered	water	11/16/2005	--	45.579130	-122.754500	--	20	--
	Peeper	LWG2-P-SLT3F_2	0 - 38	replicate	unfiltered	water	11/16/2005	--	45.579130	-122.754500	--	20	--
	Power Grab	LWG2-PG-SL3F	0 - 30	original	--	sediment	11/29/2005	14:27	45.579130	-122.754490	50	--	silt with sand surface, sand with silt below
SLT-04-A	Trident	LWG2-T30-SL4A	30	original	unfiltered	water	10/8/2005	12:40	45.57845	-122.75422	3.5	60	sand
	Trident	LWG2-T30-SL4A-Filt	30	original	filtered	water	10/8/2005	12:40	45.57845	-122.75422	3.5	60	sand
	Trident	LWG2-T90-SL4A	90	original	unfiltered	water	10/8/2005	13:15	45.57845	-122.75422	3.5	40	silt
	Trident	LWG2-T90-SL4A-Filt ³	90	original	filtered	water	10/8/2005	13:15	45.57845	-122.75422	3.5	40	silt
	Power Grab	LWG2-PG-SL4A	0 - 20	original	--	sediment	11/29/2005	14:51	45.578470	-122.754210	7	--	rock (rip rap) and sand surface, sand with gravel below
SLT-04-F	Peeper	LWG2-P-SLT4F	0 - 38	original	unfiltered	water	11/16/2005	--	45.578880	-122.754000	--	--	--
	Power Grab	LWG2-PG-SL4F	0 - 30	original	--	sediment	11/29/2005	15:14	45.578890	-122.753980	48	--	silt with sand surface, sand with silt below
SLT-05-A	Trident	LWG2-T30-SL5A	30	original	unfiltered	water	10/8/2005	15:45	45.57828	-122.75375	4	120	sand
	Trident	LWG2-T30-SL5A-Filt	30	original	filtered	water	10/8/2005	15:45	45.57828	-122.75375	4	120	sand
	Power Grab	LWG2-PG-SL5A	0 - 26	original	--	sediment	11/29/2005	15:37	45.578330	-122.753780	10	--	sand with silt surface, silt with sand below
RINSE-SL	Trident	LWG2-RINSE-SL	--	EB	unfiltered	water	10/8/2005	15:00	--	--	--	--	--
	Trident	LWG2-RINSE-SL-Filt	--	EB	filtered	water	10/8/2005	15:00	--	--	--	--	--

Notes:

EB Equipment blank
-- Not applicable

¹ Location SLT-02-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Filtered samples were also not collected for this reason. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location SLT-03-F Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

³ Location SLT-04-A Trident 90+ cm filtered PAH and TPH_{DRO/RRO} samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-9. Transition Zone Water and Bulk Sediment Sample Analyses - Siltronic.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																	Additional Lab QC Volume Collected ²
							TZW Analyte Groups							Sediment Analyte Groups										
							Metals	VOCs	PAHs	TPH-gas	TPH _{DRO/RO}	Cyanide	Conventional ¹	Metals	VOCs	TPH-gas	TPH _{PRO}	Cyanide	Grain Size	Atterberg & SG	Total Sulfides	Ammonia	SVOCs	
SLT-01-A	Trident	LWG2-T30-SL1A	30	original	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-T30-SL1A-Filt	30	original	filtered	water	X		X		X													
SLT-01-E	Peeper	LWG2-P-SLT1E	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X											
SLT-02-A	Trident	LWG2-T30-SL2A	30	original	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-T30-SL2A-Filt	30	original	filtered	water	X		X		X													
	Trident	Not Sampled ³	90+	--	--	--	NC	NC	NC	NC	NC	NC	NC											
	Power Grab	LWG2-PG-SL2A	0 - 29	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X
SLT-02-C	Peeper	LWG2-P-SLT2C	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X											
SLT-02-E	Peeper	LWG2-P-SLT2E	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X											
	Power Grab	LWG2-PG-SL2E	0 - 21	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X
SLT-03-A	Trident	LWG2-T30-SL3A	30	original	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-T30-SL3A-Filt	30	original	filtered	water	X		X		X													
	Trident	LWG2-T30-SL3A-D	30	replicate	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-T30-SL3A-D-Filt	30	replicate	filtered	water	X		X		X													
SLT-03-C	Peeper	LWG2-P-SLT3C	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X											
SLT-03-F	Trident	LWG2-T90-SL3F ⁴	120	original	unfiltered	water	X	X	X	X	X	X	X											
	Peeper	LWG2-P-SLT3F	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X											
	Peeper	LWG2-P-SLT3F_2	0 - 38	replicate	unfiltered	water	X	X	X	X	X	X	X											
	Power Grab	LWG2-PG-SL3F	0 - 30	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X
SLT-04-A	Trident	LWG2-T30-SL4A	30	original	unfiltered	water	X	X	X	X	X	X	X											X
	Trident	LWG2-T30-SL4A-Filt	30	original	filtered	water	X		X		X												X	
	Trident	LWG2-T90-SL4A	90	original	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-T90-SL4A-Filt ⁵	90	original	filtered	water	X		NC		NC													
	Power Grab	LWG2-PG-SL4A	0 - 20	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X
SLT-04-F	Peeper	LWG2-P-SLT4F	0 - 38	original	unfiltered	water	X	X	X	X	X	X	X											
	Power Grab	LWG2-PG-SL4F	0 - 30	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X
SLT-05-A	Trident	LWG2-T30-SL5A	30	original	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-T30-SL5A-Filt	30	original	filtered	water	X		X		X													
	Power Grab	LWG2-PG-SL5A	0 - 26	original	--	sediment								X	X	X	X	X	X	X	X	X	X	X
RINSE-SL	Trident	LWG2-RINSE-SL	--	EB	unfiltered	water	X	X	X	X	X	X	X											
	Trident	LWG2-RINSE-SL-Filt	--	EB	filtered	water	X		X		X													

Notes:
NC Sample collection was planned for analyte, but sample was not collected due to field constraints.
EB Equipment blank
-- Not applicable

¹ Conventional analytes include Cl, SO4, alkalinity, and pH.
² Three times the minimum sample volume were collected for lab QA/QC at these locations.
³ Location SLT-02-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Filtered samples were also not collected for this reason. Note: filtered transition zone water samples were not required in the Round 2 study.
⁴ Location SLT-03-F Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
⁵ Location SLT-04-A Trident 90+ cm filtered PAH and TPH_{PRO/RO} samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-10. Transition Zone Water and Bulk Sediment Sample Summary - Rhone Poulenc.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
RP-02-E	Trident	LWG2-T30-RP2E	30	original	unfiltered	water	10/27/2005	9:50	45.57728	-122.74952	45	120	silty sand
	Trident	LWG2-T30-RP2E-Filt	30	original	filtered	water	10/27/2005	9:0	45.57728	-122.74952	45	120	silty sand
	Trident	LWG2-T90-RP2E ¹	150	original	unfiltered	water	10/27/2005	11:00	45.57728	-122.74952	45	100	silty sand
RP-03-C	Trident	LWG2-T30-RP3C ²	30	original	unfiltered	water	10/28/2005	9:45	45.57682	-122.74925	36.1	100	silty sand
	Trident	LWG2-T30-RP3C-Filt ²	30	original	filtered	water	10/28/2005	9:45	45.57682	-122.74925	36.1	100	silty sand
	Trident	LWG2-T90-RP3C ²	150	original	unfiltered	water	10/28/2005	11:25	45.57682	-122.74925	36.1	100	silty sand
	Trident	LWG2-T90-RP3C-Filt ²	150	original	filtered	water	10/28/2005	11:25	45.57682	-122.74925	36.1	100	silty sand
	Power Grab	LWG2-PG-RP3C	0 - 24	original	--	sediment	12/1/2005	14:23	45.57681	-122.74926	38	--	silt with sand surface, sand with gravel below
RP-03-E	Trident	LWG2-T30-RP3E ³	30	original	unfiltered	water	10/27/2005	12:35	45.57702 ⁵	-122.74900 ⁵	44.5	60	silty sand
	Trident	LWG2-T90-RP3E	90	original	unfiltered	water	10/27/2005	14:15	45.57702 ⁵	-122.74900 ⁵	44.5	80	silty sand
	Trident	LWG2-T90-RP3E-Filt	90	original	filtered	water	10/27/2005	14:15	45.57702 ⁵	-122.74900 ⁵	44.5	80	silty sand
RP-07-B	Trident	LWG2-T30-RP7B	30	original	unfiltered	water	10/26/2005	10:10	45.57545	-122.74785	27.8	100	silt
	Trident	LWG2-T30-RP7B-Filt	30	original	filtered	water	10/26/2005	10:10	45.57545	-122.74785	27.8	100	silt
	Trident	LWG2-T30-RP7B-D	30	replicate	unfiltered	water	10/26/2005	10:10	45.57545	-122.74785	27.8	100	silt
	Trident	LWG2-T30-RP7B-D-Filt	30	replicate	filtered	water	10/26/2005	10:10	45.57545	-122.74785	27.8	100	silt
	Power Grab	LWG2-PG-RP7B	0 - 30	original	--	sediment	12/1/2005	15:00	45.57545	-122.74782	28	--	silt with sand
RP-07-E	Peeper	LWG2-P-RP7E	0 - 38	original	unfiltered	water	12/1/2005	--	45.57580	-122.74720	--	--	clay
	Peeper	LWG2-P-RP7E 2	0 - 38	replicate	unfiltered	water	12/1/2005	--	45.57580	-122.74720	--	--	clay
R2-RP-1	Trident	LWG2-T30-R2RP1	30	original	unfiltered	water	10/26/2005	14:50	45.57685	-122.74968	26.4	100	sand
	Trident	LWG2-T30-R2RP1-Filt ⁴	30	original	filtered	water	10/26/2005	14:50	45.57685	-122.74968	26.4	100	sand
R2-RP-2	Trident	LWG2-T30-R2RP2	30	original	unfiltered	water	10/26/2005	12:45	45.57618	-122.74945	2	110	sand with rock (rip rap)
	Trident	LWG2-T30-R2RP2-Filt	30	original	filtered	water	10/26/2005	12:45	45.57618	-122.74945	2	110	sand with rock (rip rap)
R2-RP-3	Trident	LWG2-T30-R2RP3	30	original	unfiltered	water	10/22/2005	11:25	45.57545	-122.74858	10	120	sand
	Trident	LWG2-T30-R2RP3-Filt	30	original	filtered	water	10/22/2005	11:25	45.57545	-122.74858	10	120	sand
	Power Grab	LWG2-PG-R2RP3	0 - 28	original	--	sediment	12/2/2005	9:09	45.57542	-122.74864	3	--	sand with trace gravel
RINSE-RP	Trident	LWG2-RINSE-RP	--	EB	unfiltered	water	10/24/2005	--	--	--	--	--	--
	Trident	LWG2-RINSE-RP-Filt	--	EB	filtered	water	10/24/2005	--	--	--	--	--	--

Notes:

EB Equipment blank
-- Not applicable

¹ Location RP-02-E Trident 90+ cm filtered sample not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location RP-03-C Trident 30 cm and 90+ cm unfiltered and filtered herbicide samples were not collected due to error on chain of custody specifying pesticides analysis.

³ Location RP-03-E Trident 30 cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location R2-RP-1 Trident 30 cm filtered sample for herbicides was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Trident target coordinates shown here; actual coordinates were recorded incorrectly in the field.

Table 2-11. Transition Zone Water and Bulk Sediment Sample Analyses - Rhone Poulenc.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																	Additional Lab QC Volume Collected ²
							TZW Analyte Groups					Sediment Analyte Groups												
							Metals	VOCs	Herbicides	Dioxins/furans	Conventionals ¹	Metals	VOCs	Herbicides	Dioxins/furans	Grain Size	Atterberg & SG	Pesticides	Total Sulfides	Ammonia	SVOCs	TOC		
RP-02-E	Trident	LWG2-T30-RP2E	30	original	unfiltered	water	X	X	X		X													
	Trident	LWG2-T30-RP2E-Filt	30	original	filtered	water	X		X															
	Trident	LWG2-T90-RP2E ³	150	original	unfiltered	water	X	X	X		X													
RP-03-C	Trident	LWG2-T30-RP3C ⁴	30	original	unfiltered	water	X	X	NC	X	X													
	Trident	LWG2-T30-RP3C-Filt ⁴	30	original	filtered	water	X		NC	X														
	Trident	LWG2-T90-RP3C ⁴	150	original	unfiltered	water	X	X	NC		X													
	Trident	LWG2-T90-RP3C-Filt ⁴	150	original	filtered	water	X		NC															
	Power Grab	LWG2-PG-RP3C	0 - 24	original	--	sediment						X	X	X	X	X	X	X	X	X	X			
RP-03-E	Trident	LWG2-T30-RP3E ⁵	30	original	unfiltered	water	X	X	X		X													
	Trident	LWG2-T90-RP3E	90	original	unfiltered	water	X	X	X		X													
	Trident	LWG2-T90-RP3E-Filt	90	original	filtered	water	X		X															
RP-07-B	Trident	LWG2-T30-RP7B	30	original	unfiltered	water	X	X	X	X	X													
	Trident	LWG2-T30-RP7B-Filt	30	original	filtered	water	X		X	X														
	Trident	LWG2-T30-RP7B-D	30	replicate	unfiltered	water	X	X	X	X	X													
	Trident	LWG2-T30-RP7B-D-Filt	30	replicate	filtered	water	X		X	X														
	Power Grab	LWG2-PG-RP7B	0 - 30	original	--	sediment						X	X	X	X	X	X	X	X	X	X			
RP-07-E	Peeper	LWG2-P-RP07E	0 - 38	original	unfiltered	water	X	X	X		X													
	Peeper	LWG2-P-RP07E_2	0 - 38	replicate	unfiltered	water	X	X	X		X													
R2-RP-1	Trident	LWG2-T30-R2RP1	30	original	unfiltered	water	X	X	X		X													
	Trident	LWG2-T30-R2RP1-Filt ⁶	30	original	filtered	water	X		NC															
R2-RP-2	Trident	LWG2-T30-R2RP2	30	original	unfiltered	water	X	X	X		X													X
	Trident	LWG2-T30-R2RP2-Filt	30	original	filtered	water	X		X															
R2-RP-3	Trident	LWG2-T30-R2RP3	30	original	unfiltered	water	X	X	X		X													
	Trident	LWG2-T30-R2RP3-Filt	30	original	filtered	water	X		X															
	Power Grab	LWG2-PG-R2RP3	0 - 28	original	--	sediment						X	X	X		X	X	X	X	X	X			
RINSE-RP	Trident	LWG2-RINSE-RP	--	EB	unfiltered	water	X	X	X	X	X													
	Trident	LWG2-RINSE-RP-Filt	--	EB	filtered	water	X		X	X														

Notes:
NC Sample collection was planned for analyte, but sample was not collected due to field constraints.
EB Equipment blank
-- Not applicable

¹ Conventional analytes include Cl, SO4, alkalinity, and pH.
² Three times the minimum sample volume were collected for lab QA/QC at these locations.
³ Location RP-02-E Trident 90+ cm filtered sample not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
⁴ Location RP-03-C Trident 30 cm and 90+ cm unfiltered and filtered herbicide samples were not collected due to error on chain of custody specifying pesticides analysis.
⁵ Location RP-03-E Trident 30 cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
⁶ Location R2-RP-1 Trident 30 cm filtered sample for herbicides was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-12. Transition Zone Water and Bulk Sediment Sample Summary - Arkema Acid Plant.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
AP-02-A	Trident	LWG2-T30-AP2A	30	original	unfiltered	water	10/10/2005	10:20	100	45.57200	-122.74337	3.7	silty sand
	Trident	LWG2-T30-AP2A-Filt	30	original	filtered	water	10/10/2005	10:20	100	45.57200	-122.74337	3.7	silty sand
	Power Grab	LWG2-PG-AP2A	0 - 24	original	--	sediment	11/30/2005	9:8	--	45.571960	-122.743390	5	sand with silt
AP-02-D	Trident	LWG2-T30-AP2D ¹	30	original	unfiltered	water	10/10/2005	12:40	80	45.57217	-122.74308	19.7	silt
	Trident	Not sampled ²	90+	--	--	--	--	--	--	--	--	--	silt
	Power Grab	LWG2-PG-AP2D	0 - 30	original	--	sediment	11/30/2005	9:31	--	45.572200	-122.743050	25	silt with sand
AP-03-A	Trident	LWG2-T30-AP3A	30	original	unfiltered	water	10/10/2005	14:40	110	45.57170	-122.74283	5	0 - 2 ft sand with rip rap and gravel, silt below
	Trident	LWG2-T30-AP3A-Filt	30	original	filtered	water	10/10/2005	14:40	110	45.57170	-122.74283	5	0 - 2 ft sand with rip rap and gravel, silt below
	Trident	LWG2-T30-AP3A-D	30	replicate	unfiltered	water	10/10/2005	15:15	110	45.57170	-122.74283	5	0 - 2 ft sand with rip rap and gravel, silt below
	Trident	LWG2-T30-AP3A-D-Filt	30	replicate	filtered	water	10/10/2005	15:15	110	45.57170	-122.74283	5	0 - 2 ft sand with rip rap and gravel, silt below
	Trident	LWG2-T90-AP3A ³	150	original	unfiltered	water	10/10/2005	14:55	40	45.57170	-122.74283	5	0 - 2 ft sand with rip rap and gravel, silt below
AP-03-D	Trident	LWG2-T30-AP3D ⁴	30	original	unfiltered	water	10/11/2005	10:30	40	45.57192	-122.74263	24	silty sand
	Trident	LWG2-T90-AP3D ⁴	150	original	unfiltered	water	10/11/2005	10:45	80	45.57192	-122.74263	24	silty sand
	Peeper	LWG2-P-AP3D ⁵	0 - 38	original	unfiltered	water	11/18/200	--	--	45.571886	-122.742571	--	--
AP-04-C	Peeper	LWG2-P-AP04C	0 - 38	original	unfiltered	water	11/18/2005	--	--	45.571426	-122.742301	--	--
	Power Grab	LWG2-PG-AP4C	0 - 29	original	--	sediment	11/30/2005	10:06	--	45.571430	-122.742290	10	silt with trace very fine sand
	Power Grab	LWG2-PG-AP4C-2	0 - 29	replicate	--	sediment	11/30/2005	10:29	--	45.571430	-122.742290	10	silt with trace very fine sand
R2-AP-1	Peeper	LWG2-P-R2AP1	0 - 38	original	unfiltered	water	11/18/2005	--	--	45.571625	-122.742491	--	--
	Peeper	LWG2-P-R2AP1_2	0 - 38	replicate	unfiltered	water	11/18/2005	--	--	45.571625	-122.742491	--	--
R2-AP-2	Trident	LWG2-T30-R2AP2	30	original	unfiltered	water	10/11/2005	12:45	80	45.57122	-122.74197	10.5	soft silt
	Trident	LWG2-T30-R2AP2-Filt ⁶	30	original	filtered	water	10/11/2005	10:15	80	45.57122	-122.74197	10.5	soft silt
	Trident	LWG2-T90-R2AP2 ⁶	150	original	unfiltered	water	10/11/2005	12:50	40	45.57122	-122.74197	10.5	soft silt
	Power Grab	LWG2-PG-R2AP2	0 - 29	original	--	sediment	11/30/2005	10:52	--	45.571230	-122.742010	9	silt with sand
RINSE-AP/CP ⁷	Trident	LWG2-RINSE-AP/CP	--	EB	unfiltered	water	10/12/2005	--	--	--	--	--	--
	Trident	LWG2-RINSE-AP/CP-Filt	--	EB	filtered	water	10/12/2005	--	--	--	--	--	--

Notes:

EB Equipment blank
-- Not applicable

¹ Location AP-02-D Trident 30 cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location AP-02-D Trident 90+ cm unfiltered and filtered sample were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

³ Location AP-03-A Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location AP-03-D Trident 30 cm unfiltered metals and pesticides, and 30 cm and 90+ cm filtered all analytes samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Location AP-03-D peeper sample was collected for only a pesticide sample to complement the Trident sampling at this location.

⁶ Location R2-AP-2 Trident 30 cm filtered sample for pesticides and 90+ cm filtered samples for all analytes samples were not collected due inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁷ Equipment rinsate blanks and lab QA/QC samples representative of both the Arkema Acid Plant and the Arkema Chlorate Plant were collected at the Acid Plant.

Table 2-13. Transition Zone Water and Bulk Sediment Sample Analyses - Arkema Acid Plant.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																	Additional Lab QC Volume Collected ²	
							TZW Analyte Groups					Sediment Analyte Groups													
							Metals	VOCs	Pesticides	Perchlorate	Conventionals ¹	Metals	VOCs	Pesticides	Perchlorate	Grain Size	Atterberg & SG	Cr (VI)	Total Sulfides	Ammonia	SVOCs	TOC			
AP-02-A	Trident	LWG2-T30-AP2A	30	original	unfiltered	water	X	X	X	X	X														X
	Trident	LWG2-T30-AP2A-Filt	30	original	filtered	water	X		X																
	Power Grab	LWG2-PG-AP2A	0 - 24	original	--	sediment						X	X	X	X	X	X	X	X	X	X	X	X	X	
AP-02-D	Trident	LWG2-T30-AP2D ³	30	original	unfiltered	water	X	X	X	X	X														
	Trident	Not sampled ⁴	90+	--	--	--																			
	Power Grab	LWG2-PG-AP2D	0 - 30	original	--	sediment						X	X	X	X	X	X	X	X	X	X	X	X	X	X
AP-03-A	Trident	LWG2-T30-AP3A	30	original	unfiltered	water	X	X	X	X	X														
	Trident	LWG2-T30-AP3A-Filt	30	original	filtered	water	X		X																
	Trident	LWG2-T30-AP3A-D	30	replicate	unfiltered	water	X	X	X	X	X														
	Trident	LWG2-T30-AP3A-D-Filt	30	replicate	filtered	water	X		X																
	Trident	LWG2-T90-AP3A ⁵	150	original	unfiltered	water	X	X	X	X	X														
AP-03-D	Trident	LWG2-T30-AP3D ⁶	30	original	unfiltered	water	NC	X	NC	X	X														
	Trident	LWG2-T90-AP3D ⁶	150	original	unfiltered	water	X	X	X	X	X														
	Peeper	LWG2-P-AP3D ⁷	0 - 38	original	unfiltered	water			X																
AP-04-C	Peeper	LWG2-P-AP04C	0 - 38	original	unfiltered	water	X	X	X	X	X														
	Power Grab	LWG2-PG-AP4C	0 - 29	original	--	sediment						X	X	X	X	X	X	X	X	X	X	X	X	X	
	Power Grab	LWG2-PG-AP4C-2	0 - 29	replicate	--	sediment						X	X	X	X	X	X	X	X	X	X	X	X	X	
R2-AP-1	Peeper	LWG2-P-R2AP1	0 - 38	original	unfiltered	water	X	X	X	X	X														
	Peeper	LWG2-P-R2AP1 2	0 - 38	replicate	unfiltered	water	X	X	X	X	X														
R2-AP-2	Trident	LWG2-T30-R2AP2	30	original	unfiltered	water	X	X	X	X	X														
	Trident	LWG2-T30-R2AP2-Filt ⁸	30	original	filtered	water	X		NC																
	Trident	LWG2-T90-R2AP2 ⁸	150	original	unfiltered	water	X	X	X ⁹	X	X														
	Power Grab	LWG2-PG-R2AP2	0 - 29	original	--	sediment						X	X	X	X	X	X	X	X	X	X	X	X	X	
RINSE-AP/CP ¹⁰	Trident	LWG2-RINSE-AP	--	EB	unfiltered	water	X	X	X	X	X														
	Trident	LWG2-RINSE-AP-Filt	--	EB	filtered	water	X		X																

Table 2-13. Transition Zone Water and Bulk Sediment Sample Analyses - Arkema Acid Plant.

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

EB Equipment blank

-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location AP-02-D Trident 30 cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location AP-02-D Trident 90+ cm unfiltered and filtered sample were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Location AP-03-A Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁶ Location AP-03-D Trident 30 cm unfiltered metals and pesticides, and 30 cm and 90+ cm filtered all analytes samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁷ Location AP-03-D peeper sample was collected for only a pesticide sample to complement the Trident sampling at this location.

⁸ Location R2-AP-2 Trident 30 cm filtered sample for pesticides and 90+ cm filtered samples for all analytes samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁹ Location R2-AP-2 Trident 90+ cm unfiltered pesticide sample volume was only 300 ml (less than the 500 ml target) due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment.

¹⁰ Equipment rinsate blanks and lab QA/QC samples representative of both the Arkema Acid Plant and the Arkema Chlorate Plant were collected at the Acid Plant.

Table 2-14. Transition Zone Water and Bulk Sediment Sample Summary - Arkema Chlorate Plant.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
CP-06-A	Trident	LWG2-T30-CP6A	30	original	unfiltered	water	10/12/2005	15:30	45.57062	-122.74135	100	2.5	sand surface, soft silt below
	Trident	LWG2-T30-CP6A-Filt	30	original	filtered	water	10/12/2005	15:30	45.57062	-122.74135	100	2.5	sand surface, soft silt below
	Trident	LWG2-T90-CP6A ¹	150	original	unfiltered	water	10/12/2005	15:45	45.57062	-122.74135	20	2.5	sand surface, soft silt below
CP-07-A	Trident	LWG2-T30-CP7A	30	original	unfiltered	water	10/12/2005	14:30	45.57030	-122.74093	100	8	sand
	Trident	LWG2-T30-CP7A-Filt	30	original	filtered	water	10/12/2005	14:30	45.57030	-122.74093	100	8	sand
	Power Grab	LWG2-PG-CP7A	0 - 30	original	--	sediment	11/30/2005	11:33	45.57030	-122.74089	--	11	silt surface, sand with gravel below
CP-07-B	Trident	LWG2-T30-CP7B	30	original	unfiltered	water	10/12/2005	12:55	45.57033	-122.74085	80	13.5	silt surface, sand below
	Trident	LWG2-T30-CP7B-Filt	30	original	filtered	water	10/12/2005	12:55	45.57033	-122.74085	80	13.5	silt surface, sand below
	Trident	LWG2-T90-CP7B ²	150	original	unfiltered	water	10/12/2005	13:00	45.57033	-122.74085	20	13.5	silt surface, sand below
CP-07-D	Trident	LWG2-T90-CP7D ³	150	original	unfiltered	water	10/12/2005	11:00	45.570436	-122.740771	40	22.7	soft silt
	Peeper	LWG2-P-CP7D	0 - 38	original	unfiltered	water	11/14/2005	--	45.570436	-122.740771	40	--	--
	Power Grab	LWG2-PG-CP7D	0 - 30	original	--	sediment	11/30/2005	12:43	45.57044	-122.74078	--	26	silt with trace sand
CP-08-B	Trident	LWG2-T30-CP8B	30	original	unfiltered	water	10/12/2005	9:45	45.57007	-122.74062	120	4.1	silt with sand
	Trident	LWG2-T30-CP8B-Filt	30	original	filtered	water	10/12/2005	9:45	45.57007	-122.74062	120	4.1	silt with sand
CP-09-A	Trident	LWG2-T30-CP9A	30	original	unfiltered	water	10/11/2005	15:15	45.56973	-122.74023	100	3	sand with silt
	Trident	LWG2-T30-CP9A-Filt	30	original	filtered	water	10/11/2005	15:15	45.56973	-122.74023	100	3	sand with silt
	Trident	LWG2-T30-CP9A-D	30	replicate	unfiltered	water	10/11/2005	15:30	45.56973	-122.74023	100	3	sand with silt
	Trident	LWG2-T30-CP9A-D-Filt	30	replicate	filtered	water	10/11/2005	15:30	45.56973	-122.74023	100	3	sand with silt
	Power Grab	LWG2-PG-CP9A	0 - 26	original	--	sediment	11/30/2005	13:09	45.569720	-122.740190	--	6	sand with silt and rock (rip rap) surface, silt with sand below
CP-09-D	Peeper	LWG2-P-CP9D	0 - 38	original	unfiltered	water	11/14/2005	--	45.569886	-122.740051	--	--	--
	Peeper	LWG2-P-CP9D_2	0 - 38	replicate	unfiltered	water	11/14/2005	--	45.569886	-122.740051	--	--	--
	Power Grab	LWG2-PG-CP9D	0 - 30	original	--	sediment	11/30/2005	13:36	45.569890	-122.740050	--	27	silt with trace sand
R2-CP-1	Peeper	LWG2-P-R2CP1	0 - 38	original	unfiltered	water	11/14/2005	--	45.570721	-122.741100	--	--	--

Notes:

-- Not applicable

¹ Location CP-06-A Trident 90+ cm unfiltered metals sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. For the same reason, filtered samples were not collected at this location. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location CP-07-B Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

³ Location CP-07-D Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-15. Transition Zone Water and Bulk Sediment Sample Analyses - Arkema Chlorate Plant.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses															Additional Lab QC Volume Collected ²
							TZW Analyte Groups				Sediment Analyte Groups											
							Metals	VOCs	Perchlorate	Conventionals ¹	Metals	VOCs	Perchlorate	Grain Size	Atterberg & SG	Cr (VI)	Pesticides	Total Sulfides	Ammonia	SVOCs	TOC	
CP-06-A	Trident	LWG2-T30-CP6A	30	original	unfiltered	water	X	X	X	X												
	Trident	LWG2-T30-CP6A-Filt	30	original	filtered	water	X															
	Trident	LWG2-T90-CP6A ³	150	original	unfiltered	water	NC	X	X	X												
CP-07-A	Trident	LWG2-T30-CP7A	30	original	unfiltered	water	X	X	X	X												
	Trident	LWG2-T30-CP7A-Filt	30	original	filtered	water	X															
	Power Grab	LWG2-PG-CP7A	0 - 30	original	--	sediment					X	X	X	X	X	X	X	X	X	X	X	
CP-07-B	Trident	LWG2-T30-CP7B	30	original	unfiltered	water	X	X	X	X												
	Trident	LWG2-T30-CP7B-Filt	30	original	filtered	water	X															
	Trident	LWG2-T90-CP7B ⁴	150	original	unfiltered	water	X	X	X	X												
CP-07-D	Trident	LWG2-T90-CP7D ⁵	150	original	unfiltered	water	X	X	X	X												
	Peeper	LWG2-P-CP7D	0 - 38	original	unfiltered	water	X	X	X	X												
	Power Grab	LWG2-PG-CP7D	0 - 30	original	--	sediment					X	X	X	X	X	X	X	X	X	X	X	
CP-08-B	Trident	LWG2-T30-CP8B	30	original	unfiltered	water	X	X	X	X												
	Trident	LWG2-T30-CP8B-Filt	30	original	filtered	water	X															
CP-09-A	Trident	LWG2-T30-CP9A	30	original	unfiltered	water	X	X	X	X												
	Trident	LWG2-T30-CP9A-Filt	30	original	filtered	water	X															
	Trident	LWG2-T30-CP9A-D	30	replicate	unfiltered	water	X	X	X	X												
	Trident	LWG2-T30-CP9A-D-Filt	30	replicate	filtered	water	X															
	Power Grab	LWG2-PG-CP9A	0 - 26	original	--	sediment					X	X	X	X	X	X	X	X	X	X	X	
CP-09-D	Peeper	LWG2-P-CP9D	0 - 38	original	unfiltered	water	X	X	X	X												
	Peeper	LWG2-P-CP9D_2	0 - 38	replicate	unfiltered	water	X	X	X	X												
	Power Grab	LWG2-PG-CP9D	0 - 30	original	--	sediment					X	X	X	X	X	X	X	X	X	X	X	
R2-CP-1	Peeper	LWG2-P-R2CP1	0 - 38	original	unfiltered	water	X	X	X	X												

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location CP-06-A Trident 90+ cm unfiltered metals sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. For the same reason, filtered samples were not collected at this location. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location CP-07-B Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Location CP-07-D Trident 90+ cm filtered sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-16. Transition Zone Water and Bulk Sediment Sample Summary - ExxonMobil.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
EM-01-A	Trident	LWG2-T30-EM1A	30	original	unfiltered	water	10/6/2005	14:20	45.59373	-122.77772	2	100	sand
	Trident	LWG2-T30-EM1A-Filt	30	original	filtered	water	10/6/2005	14:20	45.59373	-122.77772	2	100	sand
	Trident	LWG2-T90-EM1A	150	original	unfiltered	water	10/6/2005	15:30	45.59373	-122.77772	2	<60	sand
	Trident	LWG2-T90-EM1A-Filt ¹	150	original	filtered	water	10/6/2005	15:30	45.59373	-122.77772	2	<60	sand
EM-02-A	Trident	LWG2-T30-EM2A	30	original	unfiltered	water	10/6/2005	12:40	45.59347	-122.77580	6.1	100	sand
	Trident	LWG2-T30-EM2A-Filt	30	original	filtered	water	10/6/2005	12:40	45.59347	-122.77580	6.1	100	sand
	Trident	Not Sampled ²	90+	--	--	--	--	--	--	--	--	--	silt
	Power Grab	LWG2-PG-EM2A	0 -15	original	--	sediment	12/1/2005	11:14	45.59350 ⁸	-122.77757 ⁸	12	--	sand with rip rap over sandy silt
EM-02-C	Trident	LWG2-T30-EM2C	30	original	unfiltered	water	10/6/2005	10:50	45.59352	-122.77745	20.1	100	hard sand
	Trident	LWG2-T30-EM2C-Filt ³	30	original	filtered	water	10/6/2005	10:50	45.59352	-122.77745	20.1	100	hard sand
	Trident	Not Sampled ³	90+	--	--	--	--	--	--	--	--	--	silt
EM-03-A	Trident	LWG2-T30-EM3A	30	original	unfiltered	water	10/5/2005	14:15	45.59333	-122.77745	5.4	80	sand with silt
	Trident	LWG2-T30-EM3A-Filt	30	original	filtered	water	10/5/2005	14:15	45.59333	-122.77745	5.4	80	sand with silt
	Trident	LWG2-T90-EM3A	120	original	unfiltered	water	10/5/2005	14:30	45.59333	-122.77745	5.4	80	sand with silt
	Trident	LWG2-T90-EM3A-Filt	120	original	filtered	water	10/5/2005	14:30	45.59333	-122.77745	5.4	80	sand with silt
	Trident	LWG2-T90-EM3A-D	120	replicate	unfiltered	water	10/5/2005	14:30	45.59333	-122.77745	5.4	80	sand with silt
	Trident	LWG2-T90-EM3A-D-Filt	120	replicate	filtered	water	10/5/2005	14:30	45.59333	-122.77745	5.4	80	sand with silt
	Power Grab	LWG2-PG-EM3A	0 - 27	original	--	sediment	12/1/2005	11:38	45.59333	-122.77739	11	--	sand and gravel over silty sand
EM-04-A	Trident	LWG2-T30-EM4A	30	original	unfiltered	water	10/5/2005	12:40	45.59308	-122.77717	19.3	100	sand with silt
	Trident	LWG2-T30-EM4A-Filt	30	original	filtered	water	10/5/2005	12:40	45.59308	-122.77717	19.3	100	sand with silt
EM-04-C	Trident	LWG2-T30-EM4C	30	original	unfiltered	water	10/5/2005	9:45	45.59320	-122.77705	29.8	60	silt with sand
	Trident	LWG2-T30-EM4C-Filt	30	original	filtered	water	10/5/2005	9:45	45.59320	-122.77705	29.8	60	silt with sand
	Trident	LWG2-T90-EM4C	150	original	unfiltered	water	10/5/2005	10:15	45.59320	-122.77705	29.8	60	sand with silt
	Trident	LWG2-T90-EM4C-Filt ⁴	150	original	filtered	water	10/5/2005	10:15	45.59320	-122.77705	29.8	60	sand with silt
EM-05-A	Trident	LWG2-T30-EM5A	30	original	unfiltered	water	10/4/2005	14:45	45.59290 ⁸	-122.77700 ⁸	9.7	--	soft silt with trace sand; firm silt below 2'
	Trident	LWG2-T30-EM5A-Filt	30	original	filtered	water	10/4/2005	14:45	45.59290 ⁸	-122.77700 ⁸	9.7	--	soft silt with trace sand; firm silt below 2'
	Trident	Not Sampled ⁵	90+	--	--	--	--	--	--	--	--	--	firm silt
	Power Grab	Not Sampled ⁶	--	--	--	--	--	--	--	--	--	--	--
EM-06-B	Trident	LWG2-T30-EM6B	30	original	unfiltered	water	10/4/2005	13:10	45.59262	-122.77665	11.6	100	soft silt
	Trident	LWG2-T30-EM6B-Filt	30	original	filtered	water	10/4/2005	13:10	45.59262	-122.77665	11.6	100	soft silt
EM-08-A	Trident	LWG2-T30-EM8A	30	original	unfiltered	water	10/4/2005	10:20	45.59208 ⁸	-122.77622 ⁸	3.2	--	sand with silt
	Trident	LWG2-T30-EM8A-Filt	30	original	filtered	water	10/4/2005	10:20	45.59208 ⁸	-122.77622 ⁸	3.2	--	sand with silt
	Trident	Not Sampled ⁷	90+	--	--	--	--	--	--	--	--	--	firm silt/clay
R2-EM-1	Trident	LWG2-T30-R2EM1	30	original	unfiltered	water	10/3/2005	15:15	45.59172	-122.77559	7.2	80	silt with sand
	Trident	LWG2-T30-R2EM1-Filt	30	original	filtered	water	10/3/2005	15:15	45.59172	-122.77559	7.2	80	silt with sand
	Trident	LWG2-T30-R2EM1-D	30	replicate	unfiltered	water	10/3/2005	15:15	45.59172	-122.77559	7.2	80	silt with sand
	Trident	LWG2-T30-R2EM1-D-Filt	30	replicate	filtered	water	10/3/2005	15:15	45.59172	-122.77559	7.2	80	silt with sand
RINSE-EM	Trident	LWG2-RINSE-EM	--	EB	unfiltered	water	10/6/2005	8:30	--	--	--	--	--
	Trident	LWG2-RINSE-EM-Filt	--	EB	filtered	water	10/6/2005	8:30	--	--	--	--	--

Table 2-16. Transition Zone Water and Bulk Sediment Sample Summary - ExxonMobil.

Notes:

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-- Not applicable

- ¹ Location EM-01-A Trident 90+ cm filtered samples for PAHs and TPHs not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
- ² Location EM-02-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
- ³ Location EM-02-C Trident 30 cm filtered sample for PAHs and 90+ cm unfiltered and filtered samples for all analytes samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
- ⁴ Location EM-04-C Trident 30 cm and 90+ cm filtered samples for PAHs not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
- ⁵ Location EM-05-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
- ⁶ Location EM-01-A power grab sample was not collected due to inability to access location behind dock with equipment.
- ⁷ Location EM-08-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.
- ⁸ Target coordinates shown here; actual coordinates were recorded incorrectly in the field.

Table 2-17. Transition Zone Water and Bulk Sediment Sample Analyses - ExxonMobil.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																	Additional Lab QC Volume Collected ²
							TZW Analyte Groups						Sediment Analyte Groups											
							Metals	VOCs	PAHs	TPH-gas	TPH _{DRO/RO}	Conventional ¹	Metals	VOCs	TPH-gas	TPH _{DRO}	Grain Size	Atterberg & SG	Total Sulfides	Ammonia	SVOCs	TOC		
EM-01-A	Trident	LWG2-T30-EM1A	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM1A-Filt	30	original	filtered	water	X		X		X													
	Trident	LWG2-T90-EM1A	150	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T90-EM1A-Filt ³	150	original	filtered	water	X		NC		NC													
EM-02-A	Trident	LWG2-T30-EM2A	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM2A-Filt	30	original	filtered	water	X		X		X													
	Trident	Not Sampled ⁵	90+	--	--	--	NC	NC	NC	NC	NC	NC												
	Power Grab	LWG2-PG-EM2A	0 -15	original	--	sediment							X	X	X	X	X	X	X	X	X			
EM-02-C	Trident	LWG2-T30-EM2C	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM2C-Filt ⁴	30	original	filtered	water	X		NC		X													
	Trident	Not Sampled ⁴	90+	--	--	--	NC	NC	NC	NC	NC	NC												
EM-03-A	Trident	LWG2-T30-EM3A	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM3A-Filt	30	original	filtered	water	X		X		X													
	Trident	LWG2-T90-EM3A	120	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T90-EM3A-Filt	120	original	filtered	water	X		X		X													
	Trident	LWG2-T90-EM3A-D	120	replicate	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T90-EM3A-D-Filt	120	replicate	filtered	water	X		X		X													
	Power Grab	LWG2-PG-EM3A	0 - 27	original	--	sediment	X	X		X			X	X	X	X	X	X	X	X	X			
EM-04-A	Trident	LWG2-T30-EM4A	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM4A-Filt	30	original	filtered	water	X		X		X													
EM-04-C	Trident	LWG2-T30-EM4C	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM4C-Filt ⁵	30	original	filtered	water	X		NC		X													
	Trident	LWG2-T90-EM4C	150	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T90-EM4C-Filt ⁵	150	original	filtered	water	X		NC		X													
EM-05-A	Trident	LWG2-T30-EM5A	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM5A-Filt	30	original	filtered	water	X		X		X													
	Trident	Not Sampled ⁶	90+	--	--	--	NC	NC	NC	NC	NC	NC												
	Power Grab	Not Sampled ⁷	--	--	--	--							NC	NC	NC	NC	NC	NC	NC	NC	NC			

Table 2-17. Transition Zone Water and Bulk Sediment Sample Analyses - ExxonMobil.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses																	Additional Lab QC Volume Collected ²
							TZW Analyte Groups						Sediment Analyte Groups											
							Metals	VOCs	PAHs	TPH-gas	TPH _{DRO/RRO}	Conventionals ¹	Metals	VOCs	TPH-gas	TPH _{DRO}	Grain Size	Atterberg & SG	Total Sulfides	Ammonia	SVOCs	TOC		
EM-06-B	Trident	LWG2-T30-EM6B	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-EM6B-Filt	30	original	filtered	water	X		X		X													
EM-08-A	Trident	LWG2-T30-EM8A	30	original	unfiltered	water	X	X	X	X	X	X												X
	Trident	LWG2-T30-EM8A-Filt	30	original	filtered	water	X		X		X													
	Trident	Not Sampled ⁸	90+	--	--	--	NC	NC	NC	NC	NC	NC												
R2-EM-1	Trident	LWG2-T30-R2EM1	30	original	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-R2EM1-Filt	30	original	filtered	water	X		X		X													
	Trident	LWG2-T30-R2EM1-D	30	replicate	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-T30-R2EM1-D-Filt	30	replicate	filtered	water	X		X		X													
RINSE-EM	Trident	LWG2-RINSE-EM	--	EB	unfiltered	water	X	X	X	X	X	X												
	Trident	LWG2-RINSE-EM-Filt	--	EB	filtered	water	X		X		X													

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

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-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location EM-01-A Trident 90+ cm filtered samples for PAHs and TPH_{DRO/RRO} not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location EM-02-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Location EM-02-C Trident 30 cm filtered sample for PAHs and 90+ cm unfiltered and filtered samples for all analytes samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁶ Location EM-04-C Trident 30 cm and 90+ cm filtered samples for PAHs not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁷ Location EM-05-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁸ Location EM-01-A power grab sample was not collected due to inability to access location behind dock with equipment.

⁹ Location EM-08-A Trident 90+ cm unfiltered and filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-18. Transition Zone Water and Bulk Sediment Sample Summary - Willbridge.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
W-04-C	Peeper	LWG2-P-W4C	0 - 38	original	unfiltered	water	11/30/2005	--	45.56657	-122.73942	--	--	--
	Peeper	LWG2-P-W4C_2	0 - 38	replicate	unfiltered	water	11/30/2005	--	45.56657	-122.73942	--	--	--
W-06-A	Trident	LWG2-T30-W6A	30	original	unfiltered	water	10/20/2005	13:30	45.56605	-122.73903	12.3	120	firm silt/clay
	Trident	LWG2-T30-W6A-Filt	30	original	filtered	water	10/20/2005	13:30	45.56605	-122.73903	12.3	120	firm silt/clay
	Trident	Not sampled ¹	90+	--	--	--	--	--	--	--	--	--	firm silt/clay
W-07-C	Trident	LWG2-T30-W7C	30	original	unfiltered	water	10/20/2005	11:50	45.56592	-122.738801	16.5	100	firm silt/clay
	Trident	LWG2-T30-W7C-Filt	30	original	filtered	water	10/20/2005	11:50	45.56592	-122.738801	16.5	100	firm silt/clay
	Trident	Not sampled ²	90+	--	--	--	--	--	--	--	--	--	firm silt/clay
W-09-A	Trident	LWG2-T30-W9A	30	original	unfiltered	water	10/20/2005	10:20	45.56567	-122.73843	9.6	100	firm silt/clay
	Trident	LWG2-T30-W9A-Filt	30	original	filtered	water	10/20/2005	10:20	45.56567	-122.73843	9.6	100	firm silt/clay
	Trident	Not sampled ³	90+	--	--	--	--	--	--	--	--	--	clay/silt
	Power Grab	LWG2-PG-W9A	0 - 23	original	--	sediment	11/30/2005	14:16	45.56561	-122.73843	7	--	silt with trace gravel surface, firm silt/clay below
W-09-C	Peeper	LWG2-P-W9C	0 - 38	original	unfiltered	water	11/28/2005	--	45.56575	-122.73810	--	--	--
	Power Grab	LWG2-PG-W9C	0 - 30	original	--	sediment	11/30/2005	14:40	45.56577	-122.73809	30	--	silt with trace sand
W-12-A	Trident	LWG2-T30-W12A	30	original	unfiltered	water	10/20/2005	15:15	45.56495	-122.73728	3.1	80	sand
	Trident	LWG2-T30-W12A-Filt	30	original	filtered	water	10/20/2005	15:15	45.56495	-122.73728	3.1	80	sand
	Trident	LWG2-T30-W12A-D	30	replicate	unfiltered	water	10/20/2005	15:15	45.56495	-122.73728	3.1	80	sand
	Trident	LWG2-T30-W12A-D-Filt	30	replicate	filtered	water	10/20/2005	15:15	45.56495	-122.73728	3.1	80	sand
R2-W-2	Trident	LWG2-T30-R2W2	30	original	unfiltered	water	10/19/2005	15:45	45.56525	-122.73782	15.7	80	silt with sand
	Trident	LWG2-T30-R2W2-Filt ⁴	30	original	filtered	water	10/19/2005	15:45	45.56525	-122.73782	15.7	80	silt with sand
RINSE-W	Trident	LWG2-RINSE-W	--	EB	unfiltered	water	10/20/2005	8:30	--	--	--	--	--
	Trident	LWG2-RINSE-W-Filt	--	EB	filtered	water	10/20/2005	8:30	--	--	--	--	--

Notes:

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-- Not applicable

¹ Location W-06-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

² Location W-07-C Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

³ Location W-09-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location R2-W-2 Trident 30 cm filtered samples for PAH and TPH_{DRO/RRO} samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. For the same reason, filtered samples were not collected at this location. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-19. Transition Zone Water and Bulk Sediment Sample Analyses - Willbridge.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses														Additional Lab QC Volume Collected ²	
							TZW Analyte Groups						Sediment Analyte Groups									
							Metals	VOCs	PAHs	TPH-gas	TPH _{DRO}	Conventionals ¹	Metals	VOCs	TPH-gas	TPH _{DRO}	Grain Size	Atterberg & SG	Total Sulfides	Ammonia		SVOCs
W-04-C	Peeper	LWG2-P-W4C	0 - 38	original	unfiltered	water	X	X	X	X	X	X										
	Peeper	LWG2-P-W4C 2	0 - 38	replicate	unfiltered	water	X	X	X	X	X	X										
W-06-A	Trident	LWG2-T30-W6A	30	original	unfiltered	water	X	X	X	X	X	X										
	Trident	LWG2-T30-W6A-Filt	30	original	filtered	water	X		X		X											
	Trident	Not sampled ³	90+	--	--	--	NC	NC	NC	NC	NC	NC										
W-07-C	Trident	LWG2-T30-W7C	30	original	unfiltered	water	X	X	X	X	X	X										
	Trident	LWG2-T30-W7C-Filt	30	original	filtered	water	X		X		X											
	Trident	Not sampled ⁴	90+	--	--	--	NC	NC	NC	NC	NC	NC										
W-09-A	Trident	LWG2-T30-W9A	30	original	unfiltered	water	X	X	X	X	X	X										
	Trident	LWG2-T30-W9A-Filt	30	original	filtered	water	X		X		X											
	Trident	Not sampled ⁵	90+	--	--	--	NC	NC	NC	NC	NC	NC										
	Power Grab	LWG2-PG-W9A	0 - 23	original	--	sediment							X	X	X	X	X	X	X	X	X	
W-09-C	Peeper	LWG2-P-W9C	0 - 38	original	unfiltered	water	X	X	X	X	X	X										
	Power Grab	LWG2-PG-W9C	0 - 30	original	--	sediment							X	X	X	X	X	X	X	X	X	
W-12-A	Trident	LWG2-T30-W12A	30	original	unfiltered	water	X	X	X	X	X	X										X
	Trident	LWG2-T30-W12A-Filt	30	original	filtered	water	X		X		X											
	Trident	LWG2-T30-W12A-D	30	replicate	unfiltered	water	X	X	X	X	X	X										
	Trident	LWG2-T30-W12A-D-Filt	30	replicate	filtered	water	X		X		X											
R2-W-2	Trident	LWG2-T30-R2W2	30	original	unfiltered	water	X	X	X	X	X	X										
	Trident	LWG2-T30-R2W2-Filt ⁶	30	original	filtered	water	X		NC		NC											
RINSE-W	Trident	LWG2-RINSE-W	--	EB	unfiltered	water	X	X	X	X	X	X										
	Trident	LWG2-RINSE-W-Filt	--	FR	filtered	water	X		X		X											

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

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-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location W-06-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁴ Location W-07-C Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁵ Location W-09-A Trident 90+ cm sample was not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

⁶ Location R2-W-2 Trident 30 cm filtered samples for PAH and TPH _(DRO/RINSE) samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. For the same reason, filtered samples were not collected at this location. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-20. Transition Zone Water and Bulk Sediment Sample Summary - Gunderson.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Date	Time	Latitude (NAD 83)	Longitude (NAD 83)	River Water Depth (feet)	Pump Rate (ml/min)	General Sediment Description
GN-01-E	Trident	LWG2-T90-GN1E	150	original	unfiltered	water	10/22/2005	11:25	45.56023	-122.72707	26.6	80	sand with silt
	Trident	LWG2-T90-GN1E-Filt	150	original	filtered	water	10/22/2005	11:25	45.56023	-122.72707	26.6	80	sand with silt
	Peeper	LWG2-P-GN1E	0 - 38	original	unfiltered	water	11/28/2005	--	45.56021	-122.72702	--	--	--
	Power Grab	LWG2-PG-GN1E	0 - 21	original	--	sediment	12/2/2005	10:27	45.56022	-122.72702	24	--	firm silt/clay
GN-02-E	Peeper	LWG2-P-GN2E	0 - 38	original	unfiltered	water	11/28/2005	--	45.55987	-122.72650	--	--	--
	Peeper	LWG2-P-GN2E_2	0 - 38	replicate	unfiltered	water	11/28/2005	--	45.55987	-122.72650	--	--	--
	Powergrab	LWG2-PG-GN2E	0 - 26	original	--	sediment	12/2/2005	10:36	45.55987	-122.72652	28	--	firm silt/clay
GN-03-A	Peeper	LWG2-P-GN3A	0 - 38	original	unfiltered	water	11/28/2005	--	45.55853	-122.72720	--	--	--
GN-04-A	Trident	LWG2-T30-GN4A	30	original	unfiltered	water	10/21/2005	13:20	45.55827	-122.72677	5.3	100	silt with sand
	Trident	LWG2-T30-GN4A-Filt	30	original	filtered	water	10/21/2005	13:20	45.55827	-122.72677	5.3	100	silt with sand
	Trident	LWG2-T30-GN4A-D ¹	30	replicate	unfiltered	water	10/21/2005	13:20	45.55827	-122.72677	5.3	100	silt with sand
	Trident	LWG2-T90-GN4A ¹	90	original	unfiltered	water	10/21/2005	13:20	45.55827	-122.72677	5.3	60	silt
GN-04-B	Peeper	LWG2-P-GN4B	0 - 38	original	unfiltered	water	11/29/2005	--	45.55870	-122.72647	--	--	--
GN-05-A	Trident	LWG2-T30-GN5A	30	original	unfiltered	water	10/21/2005	10:25	45.55803	-122.72630	6.8	100	silty sand
	Trident	LWG2-T30-GN5A-Filt	30	original	filtered	water	10/21/2005	10:25	45.55803	-122.72630	6.8	100	silty sand
	Trident	LWG2-T90-GN5A	150	original	unfiltered	water	10/21/2005	10:25	45.55803	-122.72630	6.8	100	silt with sand surface, silt below
	Trident	LWG2-T90-GN5A-Filt	150	original	filtered	water	10/21/2005	10:25	45.55803	-122.72630	6.8	100	silt with sand surface, silt below
	Trident	LWG2-T90-GN5A-D	150	replicate	unfiltered	water	10/21/2005	10:25	45.55803	-122.72630	6.8	100	silt with sand surface, silt below
	Trident	LWG2-T90-GN5A-D-Filt	150	replicate	filtered	water	10/21/2005	10:25	45.55803	-122.72630	6.8	100	silt with sand surface, silt below
	Power Grab	LWG2-PG-GN5A	0 - 27	original	--	sediment	12/2/2005	11:15	45.55805	-122.72633	7.5	--	sand with silt surface, silt with sand below
	Power Grab	LWG2-PG-GN5A-2	0 - 27	replicate	--	sediment	12/2/2005	11:41	45.55805	-122.72631	7.5	--	sand with silt surface, silt with sand below
R2-GN-1	Peeper	LWG2-P-R2GN1	0 - 38	original	unfiltered	water	11/28/2005	--	45.56056	-122.72679	--	--	--
	Power Grab	LWG2-PG-R2GN1	0 - 27	original	--	sediment	12/2/2005	9:44	45.56055	-122.72679	36	--	silt with sand
RINSE-GN	Trident	LWG2-RINSE-GN	--	EB	unfiltered	water	10/24/2005	8:15	--	--	--	--	--
	Trident	LWG2-RINSE-GN-Filt	--	EB	filtered	water	10/24/2005	8:15	--	--	--	--	--

Notes:

- EB Equipment blank
- Not applicable

¹ Location GN-04-A Trident 30 cm filtered replicate and 90+ cm filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 2-21. Transition Zone Water and Bulk Sediment Sample Analyses - Gunderson.

Location ID	Sampling Tool	Sample ID	Sample Depth (cm below mudline)	Sample Type	Filtration	Sample Matrix	Analyses												Additional Lab QC Volume Collected ²
							TZW Analyte Groups			Sediment Analyte Groups									
							Metals	VOCs	Conventionals ¹	Metals	VOCs	Grain Size	Atterberg & SG	Butyltins	Total Sulfides	Ammonia	SVOCs	TOC	
GN-01-E	Trident	LWG2-T90-GN1E	150	original	unfiltered	water	X	X	X										
	Trident	LWG2-T90-GN1E-Filt	150	original	filtered	water	X												
	Peeper	LWG2-P-GN1E	0 - 38	original	unfiltered	water	X	X	X										
	Power Grab	LWG2-PG-GN1E	0 - 21	original	--	sediment				X	X	X	X	X	X	X	X		
GN-02-E	Peeper	LWG2-P-GN2E	0 - 38	original	unfiltered	water	X	X	X										
	Peeper	LWG2-P-GN2E_2	0 - 38	replicate	unfiltered	water	X	X	X										
	Powergrab	LWG2-PG-GN2E	0 - 26	original	--	sediment				X	X	X	X	X	X	X	X	X	
GN-03-A	Peeper	LWG2-P-GN3A	0 - 38	original	unfiltered	water	X	X	X										
GN-04-A	Trident	LWG2-T30-GN4A	30	original	unfiltered	water	X	X	X										
	Trident	LWG2-T30-GN4A-Filt	30	original	filtered	water	X												
	Trident	LWG2-T30-GN4A-D ³	30	replicate	unfiltered	water	X	X	X										
	Trident	LWG2-T90-GN4A ³	90	original	unfiltered	water	X	X	X										
GN-04-B	Peeper	LWG2-P-GN4B	0 - 38	original	unfiltered	water	X	X	X										
GN-05-A	Trident	LWG2-T30-GN5A	30	original	unfiltered	water	X	X	X									X	
	Trident	LWG2-T30-GN5A-Filt	30	original	filtered	water	X												
	Trident	LWG2-T90-GN5A	150	original	unfiltered	water	X	X	X										
	Trident	LWG2-T90-GN5A-Filt	150	original	filtered	water	X												
	Trident	LWG2-T90-GN5A-D	150	replicate	unfiltered	water	X	X	X										
	Trident	LWG2-T90-GN5A-D-Filt	150	replicate	filtered	water	X												
	Power Grab	LWG2-PG-GN5A	0 - 27	original	--	sediment				X	X	X	X	X	X	X	X		
	Power Grab	LWG2-PG-GN5A-2	0 - 27	replicate	--	sediment				X	X	X	X	X	X	X	X		
R2-GN-1	Peeper	LWG2-P-R2GN1	0 - 38	original	unfiltered	water	X	X	X										
	Power Grab	LWG2-PG-R2GN1	0 - 27	original	--	sediment				X	X	X	X	X	X	X	X		
RINSE-GN	Trident	LWG2-RINSE-GN	--	EB	unfiltered	water	X	X	X										
	Trident	LWG2-RINSE-GN-Filt	--	EB	filtered	water	X												

Notes:

NC Sample collection was planned for analyte, but sample was not collected due to field constraints.

EB Equipment blank

-- Not applicable

¹ Conventional analytes include Cl, SO₄, alkalinity, and pH.

² Three times the minimum sample volume were collected for lab QA/QC at these locations.

³ Location GN-04-A Trident 30 cm filtered replicate and 90+ cm filtered samples were not collected due to inability to produce adequate volume/flow rate with the Trident in fine-grained sediment. Note: filtered transition zone water samples were not required in the Round 2 study.

Table 4-1. Summary of Sample Collection Deviations from the Field Sampling Planning Documents.

Site	Planned Sample	Description of Deviation	Explanation/Discussion
Trident - Transition Zone Water¹			
Kinder Morgan	90+ cm sample at KM-08-A	Sample not collected	Inadequate volume/flow from Trident
Kinder Morgan	30 cm sample at R2-KM-2	Metals, PAHs, TPH _{DRO/RRD} , and conventionals not collected	Inadequate volume/flow from Trident - only TPHg and VOC analytes collected
Kinder Morgan	90+ cm sample at R2-KM-2	PAHs, TPH _{DRO/RRD} , and conventionals not collected	Inadequate volume/flow from Trident
ARCO	90+ cm sample at ARC-02-A	Sample not collected	Inadequate volume/flow from Trident
Gasco	30 cm sample at GSC-04-A	Sample not attempted	In-water remedial work at Gasco prevented sampling access
Gasco	30 cm sample at GSC-05-A	Sample not attempted	In-water remedial work at Gasco prevented sampling access
Gasco	30 cm sample at GSC-05-B	Sample not attempted	In-water remedial work at Gasco prevented sampling access
Gasco	30 cm sample at GSC-06-A	Sample not attempted	In-water remedial work at Gasco prevented sampling access
Gasco	90+ cm sample at GSC-04-A	Sample not attempted	In-water remedial work at Gasco prevented sampling access
Gasco	90+ cm sample at GSC-05-A	Sample not attempted	In-water remedial work at Gasco prevented sampling access
Gasco	90+ cm sample at GSC-07-B	Sample not attempted	Inadequate volume/flow from Trident
Gasco	90+ cm sample at GSC-07-D	Metals, PAHs, TPH _{DRO/RRD} , cyanide, and conventionals not collected	Inadequate volume/flow from Trident
Siltronic	90+ cm sample at SLT-02-A	Sample not collected	Inadequate volume/flow from Trident
Rhone Poulenc	30 and 90+ samples at RP-03-C	Herbicides not analyzed	Herbicides were not analyzed due to an error on chain of custody specifying pesticides analysis.
Arkema Acid Plant	90+ cm sample at AP-02-D	Sample not collected	Inadequate volume/flow from Trident
Arkema Acid Plant	30 cm sample at AP-03-D	Samples for metals not collected	Inadequate volume/flow from Trident for metals analysis - all other analytes collected
Arkema Acid Plant	90+ cm sample at R2-AP-2	Only 300 mL (500 mL target volume) collected for pesticide sample	Inadequate volume/flow from Trident
Arkema Chlorate Plant	90+ cm sample at CP-06-A	Metals sample not collected	Inadequate volume/flow from Trident
ExxonMobil	90+ cm sample at EM-02-A	Sample not collected	Inadequate volume/flow from Trident
ExxonMobil	90+ cm sample at EM-02-C	Sample not collected	Inadequate volume/flow from Trident
ExxonMobil	90+ cm sample at EM-05-A	Sample not collected	Inadequate volume/flow from Trident
ExxonMobil	90+ cm sample at EM-08-A	Sample not collected	Inadequate volume/flow from Trident
Willbridge	90+ cm sample at W-06-A	Sample not collected	Inadequate volume/flow from Trident
Willbridge	90+ cm sample at W-07-C	Sample not collected	Inadequate volume/flow from Trident
Willbridge	90+ cm sample at W-09-A	Sample not collected	Inadequate volume/flow from Trident
Peeper Transition Zone Water			
ARCO	Peeper original and replicate samples at AR-04-B	Samples for conventional analyses not collected; sample depth was 0 to 25 cm	Upper third of plate peepers found to be above sediment at time of retrieval. This portion was not sampled. All other analytes were collected.
Power Grab Bulk Sediment Samples			
ExxonMobil	Surface sediment grab at EM-05-A	Sample not collected	Location could not be accessed behind dock structure.

¹ Note: Because collection of filtered samples was not required for this sampling program, failure to collect filtered samples at select locations or failure collect select analytes for filtered samples are not listed in this deviations table. This situation is, however, footnoted in each of the sample summary tables (Table 2-2 through 2-21).

Appendix A



PORTLAND HARBOR RI/FS
ROUND 2 GROUNDWATER PATHWAY ASSESSMENT
TRANSITION ZONE WATER SAMPLING
FIELD SAMPLING REPORT

APPENDIX A
TRIDENT FIELD DATA SHEETS AND FIELD NOTES

DRAFT

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

January 31, 2006

10/5/05 LUG TEL SAMPLING 801-01-52
J. MOORE

0730 ARRIVE PRESS LAB. LEAD UP PL THE SAT.
MOD TO PRESS MARINA

PERSONNEL J. MOORE - INTECH
B. CHASWICK, J. GLOVES, MICK SCHAU - CMA

SCUPE TO SET UP BOAT FOR TEL SAMPLING -
LEAD UP PL THE SAT. AFTER DRAINING THE SCUPE
WORK EXCAVATION AS FIRST SITE

UBATHUR JARM WINDY HEAVY SHOWERS

0900 ARRIVE PRESS MARINA. BEGIN WEATHERING -
SHORT AND LONG EQUIPMENT FOR SPT & ZPT
SAMPLING
CLEARANCE GIVEN FOR WORK AT EXCAVATION

0950: CONDUCT FULL H.E.S. MEETING AND CONCLUDE
SCUPE AT WORK

1200 MOD TO EXCAVATION

1345 ARRIVE EM SITE LOCATION R2-EM-1
NOTE: UPLAND IS CLAY BANK WITH RIP-RAP
WITH SLOPE TOP STREET DEJO FROM CAN

1350 CALIBRATE ULTRASONIC GP - TDS/PH/TEMP/DO
CALIBRATE TROUBLE PROBE CONDUCTIVITY

NOTE: PROBLEMS WITH ULTRASONIC - ONLY TDS/TEMP/DO
CAN BE CALIBRATED

PROBE CONDUCTIVITY ON ZPT IS 2000 μ S
FOR 150 μ S SOLUTION, REFERENCE PROBE IS
1600 μ S

1615: SAMPLE LUG2-T30-R2EM1 FLOW 0.00 m/min
ALSO DUPLICATE SAMPLE COLLECTED LUG2-T30-R2EM1

1700 SAMPLING COMPLETE - DECON

1710 MOD TO PRESS MARINA - UNLOADS

1800 MOD TO LAB
1830 LEAVE LAB

10/4/05 LUG TEL SAMPLING 801-01-52
J. MOORE

0730 ARRIVE PRESS LAB. LEAD UP PL THE SAT.
MOD TO PRESS MARINA

PERSONNEL J. MOORE - INTECH
B. CHASWICK, M. CHADWICK, M. SCHAU, J. GLOVES

SCUPE TO SAMPLE REMAINING LOCATIONS AT EXCAVATION
USING SPT AND DOWN PRESSURE TROUBLE TEL
NOTE THAT DREDGE URU IS STILL ACTIVE AT
GASLO + SICTRONIC SITES - TAP POOL REMOVAL
CLEARANCE GIVEN AT EXCAVATION

0800 ARRIVE PRESS MARINA. CALIBRATE INSTRUMENTS
1FE PROBE CONDUCTIVITY = 1540 μ S
REFERENCE PROBE = 1900 μ S
ULTRASONIC CONDUCTIVITY = 1490 μ S (STANDARD) (1500 μ S)

0900 MOD TO EXCAVATION. CAN CORRE GUARD/SHIELD

0935: ARRIVE AT EM 8A. BEGIN DECON + READ -
DOCK + 1FE PROBE

1000: DECON 1FE + SPT PRODES, BEGIN P-RCE

1005: 1FE IS PULLING 100 m/min DECON TO P-RCE
3X FOR LAB QA

1010: SPT PROBE WILL NOT PUMP BELOW 60 cm,
SAND W/ SILE FROM 0.2 FT. FIRM SILE/CLAY
BELOW - CANNOT PUMP IN SILE/CLAY - ADJUST
SAMPLE

1020: BEGIN SAMPLING LUG2-T30-EM8A

1215: END SAMPLING, DECON

1230: BEGIN PREPARING SAND PACK IN 30 cm PROBE - ARRIVE
EM 8B - 70 FT SOUTH OF LOCATION DUE TO PILING
BUT SAME DISTANCE FROM SHORE

1300: BEGIN SAMPLING LUG2-T30-EM8B

10/4/05 LUG TRACER T2W B01-01-52

1400: 30A SAMPLE 163 SECUR T03 TO J. MOORE

EMISA

1420: MAKE EMISA BEGUN SAND PUMP PROBES FOR 30cm + 5FE PROBES

1435: BEGUN PUMP 30cm PROBE - 100 ml/min

1445: BEGUN SAMPLING LUG2-T30-EMISA

1450: TRY TO SAMPLE WITH 5FE PROBE - ARM
SIT IS BELOW 2 FE - THE SCREEN CAUSO - WALS
BELOW 2 FE

1600: FINISH SAMPLING EMISA 30cm, ARM
5FE SAMPLING EFFORT

1615: DECON

1630: MOB TO PEST MARUA CAN EXAMOBIL,
COST GUARD, SHERIFF

1715: ARRIVE AT PRESS - WILSONS - MOB TO GREEN
LAB

1735: ARRIVE AT LAB - LUG2O SAMPLES

1800: LEAVE LAB

10/4/05

18:20 hrs

10/5/05 LUG TRACER T2W B01-01-52

J. MOORE

0745: ARRIVE FIELD LAB, LUG2O IN THE LAB

PERSONNEL: J. MOORE, J. TEHAR

M. CHASQUICZ, D. CHADWICK, J. GUNER, M. SCHAU, CHA

SCARF TO CONTINUE SAMPLING T2W WITH 1FE + 5FE

TRACER PROBES AT EXAMOBIL

CLEARANCE GIVEN TO DOCKS AT EXAMOBIL

0830: ARRIVE PRESS MARUA, LAB

0855: MOB TO EXAMOBIL, CAN COST GUARD/SHERIFF

0900: CALIBRATE CONDUCTIVITY

1FE PROBE - 1560 m/s

REFERENCE PROBE: 1600 m/s

ULTRAMETER: 1490 m/s

(1500 m/s
STANDARD)

CALIBRATE SEPARATE PH PROBE
4 mV / 100 mV

0920: BEGUN PUMP AT LOCATION EM 4C, 30cm
PROBE. 250 ml/min pump

0945: BEGUN SAMPLING LUG2-T30-EM4C

1000: 5FE PROBE ISOLATED - BEGUN PUMP (AT 5FE)

1015: 250 ml Pumped. Begin sampling LUG2-T90-EM4C

1200: END SAMPLING BOTH T90 + T30 - ALL SAMPLES
COLLECTED APART FROM FILTERED PANTS

1210: DECON - MOB TO EM 4A

1215: SET UP FOR 30cm SAMPLE AT EM 4A

1220: BEGUN PUMP, 250 ml Pumped - BEGUN SAMPLING
LUG2-T30-EM4A

1320: END SAMPLING AT EM 4A - DECON

1335: MOB TO EM 3A

1400: SET UP 5FE + 1FE PROBES

1415: BEGUN PUMP LUG2-T30-EM3A AFTER 250 ml
Pumped

10/5/05 LUG-FEZ SAMPLING BOI-01-SZ
J. MOORE

1430 BEGIN SAMPLING LUG-T90-EM3A THE
PROBE ENTER W. AT 4 FT BELOW MUDLINE

1500 FINISH SAMPLING/SAMPLING EM3A 1 FT SAMPLE
START SAMPLING EM3A 4 FT DUPLICATE

LOG2-T90-EM3A-D

1630 STOP PULLING (SAMPLING EM3A 4 FT SAMPLE
+ DUP.

1645 DELOU - MOD TO FLESS MARINA
CALL EXXOMODUL / CAST GUARD / SHELL

1710 ARRIVE FLESS MARINA UNLOAD MOD TO LAB

1730 ARRIVE AT LAB, TRANSFER SAMPLES

1810 LEAVE LAB

JM

10/5/05
1810 hrs.

110/06/05 LUG-TRIDEST-FEZ SAMPLING BOI-01-SZ
J. MOORE

0730 ARRIVE FLESS MARINA LEAVE W. FOR THE CITY

0800 FINISH T. MOORE - FLESS MARINA
J. CHASWICK, M. CHASWICK, M. SCHAW, J. CHAWER
- CM2

SCAFF TO CONTINUE SAMPLING EXXOMODUL FEZ LUG
1 FT + 5 FT TRIDEST PROBES COLLECT RINSTATE

0800 ARRIVE FLESS MARINA PREPARE SPT + 1 FT
PROBE FOR RINSTATE SAMPLE

0830 BEGIN SAMPLING RINSTATE LUG2-RINSE-EM
UNLOAD MOD TO EXXOMODUL CM2C

1000 END SAMPLING EM RINSTATE MODS TO FINISH
PREPARE FOR LOCATION EM2C

CALL CAST GUARD / SHELL / EXXOMODUL - CLEARANCE
GIVEN

CAUTIONATE PROBE + ULTRASONIC

ULTRASONIC 1524 m/s CONDUCTIVITY

1 FT PROBE 1530

RETRIEVE 1600

PH 4.7/10 mm

TSS - OFD

1010 BEGIN PREPARING FOR SAMPLING SPT / 1 FT AT
EM2C

1030 DEPLOY 1 FT PROBE BEGIN PURGE SAND

1040 DEMON SPT PROBE TRY TO PURGE - SIFT
FROM 2 FT DEPTH TO 5 FT SAND ABOVE PROBLEMS
PULLING

1050 BEGIN SAMPLING 1 FT AT 100 - 1 FT PURGE
LUG2-T90-EM2C

1100 ABORT SAMPLING SPT SAMPLE - NO WATER

1200 FINISH SAMPLING 1 FT SAMPLE - CONTINUE

10/6/05 LUG-THOUGHT TREN SAMPLING BOI-DL-52
J. MOORE

COLLECT FILTERED PAH FOR CASE COLLECTION

1215: Pull up probes - DEC

1220: MONO TO EM-2A READ SPT + IFT 4500

1230: SET TENDS - SET AND IFT probe

1240: 250 ml purged, BEGIN SAMPLING IFT probe
LUG-THO-EM-2A

1300: ABANDON SPT PROBE - SAME PROBE IN
EM-2C.

1340: STOP SAMPLING EM-2A IFT COMPLETE SITE

1345: MOB TO EM-1A - DEC - + SET SPT/IFT
PROBES.

1400: SET PROBES IFT + SPT, Begin purge -
SPT not working

1420: BEGIN SAMPLING LUG-THO-EM-1A IFT

1500: END SAMPLING LUG-THO-EM-1A IFT

- GET SPT WORKING

1530: AFTER 250 ml purged begin sampling SPT
LUG-THO-EM-1A

1600: END SAMPLING SPT SAME, could not

collect filtered DRO or PAH at SPT
location - no flow - sand still

1650: Pull probes - DEC - MOB TO FLEET MARINA

1715: ARRIVE FLEET - UNLOAD - MOB TO FLEET
HALL

1800: ARRIVE FLEET HALL - UNLOAD

1820: LEAVE FLEET HALL

JM

10/6/05
1830 hrs

10/7/05 LUG-THOUGHT TREN SAMPLING BOI-DL-52
J. MOORE

0730: ARRIVE FLEET HALL - UNLOAD - MOB TO
FLEET MARINA

PERSONNEL: J. MOORE - INTERPRET
M. CHAMBERLAIN, D. CHAMBERLAIN, S. CLOVES, M. SCHAU - CBA

SLURP: TO SAMPLE TREN AT SICTRONIC USING IFT/SET
PROBES.

0810: ARRIVE AT PRESIDENTIAL - LOAD UP FOR THE DAY
PROBLEMS WITH SHORT OUTBOARDS MOTOR - MECHANIC
IS COMING TO FIX IT

0900: CALIBRATE PROBES - INTERFERER

IFT probe cond: 1550 u/s

REFERENCE PROBE: 1600 u/s

INTERFERER: 1529 u/s

PH, ORP - TDS

(1500 u/s STANDARD)

0930: MOB TO SICTRONIC - MOTOR FIXED. CALIBRATE GRAB
SHOULDER.

1005: ON LOCATION SL-3A - SET UP IFT PROBE

1010: DEPLOY IFT probe - begin purging

1020: 500 ml purged - begin sampling LUG-THO-SL-3A

1050: BEGIN SAMPLING DUPLICATE LUG-THO-SL-3A - D

1230: END SAMPLING SL-3A - MOB TO SL-2A - DEC

1240: PREPARE IFT/SET FOR SAMPLING

1310: P.M. IFT 3900 - BEGIN SAMPLING IFT
LUG-THO-SL-2A

1330: BEGIN SAMPLING IFT, LUG-THO-SL-2A

1400: ABOUT SPT SAMPLE - SIFT FLOWING SCREEN - EVEN
AFTER MULTIPLE DEPLOYMENTS

1420: END SAMPLING IFT SL-2A - DEC

1425: MOB TO SL-1A - PREPARE IFT PROBE

1430: BEGIN PURGE / SAMPLE LUG-THO-SL-1A

10/7/55 LUG TREN TRIDENT SAMPLING BOI-01-52
J. MOORE

1600 : FINISH SAMPLING 1st SLIA DECU
1605 : MOD TO RESS MARSA
1650 : ARRIVE RESS MARSA MOD TO FIDU LABS
1800 : LEAVE FIDU LABS

JH

10/7/55
1800 hrs

10/8/55 LUG TREN TRIDENT SAMPLING BOI-01-52
J. MOORE

0710 : ARRIVE FIDU LABS. LOAD UP FOR THE DAY
PERSONNEL : J. MOORE, INTEGRAL
B. CHADWICK, M. CHADWICK, J. GUNTER, M. SCHMIDT - CHA
SCOPE : TO CONTINUE SAMPLING SILT/POSS. USING SFT/LFE
TRIDENT PROBES
0810 : ARRIVE RESS MARSA, LOAD UP FOR THE
DAY
CALIBRATE PROBES
ULTRAMETER COND. - 1561 m/s
1st PROBE - 1580 m/s
REPTABLE PROBE - 1600 m/s
ULTRAMETER PH. OFF TDS
0900 : MOD TO SILT/POSS - CAN CAST GUAGE / SHELL
0950 : ARRIVE AT SL3F, PREPARE SFT PROBE
1000 : INSERT SFT PROBE - DECU PAGE
1020 : DECU SAMPLING LUG2-T90-SL3F, U. SLOW
PROBE AT SFT DEPTH
NOTE : NO FIDUCIAL SAMPLES COLLECTED - NOT ENOUGH WATER
TO RUN FIDUCIAL AND PUSH THROUGH
1105 : ENA PAGE / SAMPLE - NO FIDUCIAL SAMPLE TAKEN
NOTE : SFT PROBE PULSED 3400 TO 7100 AT 50
BENDS IN PROBE OCCURRED - THE SAMPLE MAY HAVE
BEEN ONLY 2-4 FE DEEP
1225 : MOD TO SL4A
1230 : ARRIVE SL4A, PREP SFT/LFE PROBES
1240 : DECU PAGE OF 1st MOBE
1245 : DECU SAMPLING LUG2-T90-SL4A
1315 : DECU SAMPLING LUG2-T90-SL4A - 3 FT DECU
- ALSO SAMPLE 1st FIDU LAB QA
1450 : COMPLETE QA SAMPLE, AND END SFT SAMPLE
- WITHOUT FIDUCIAL DRO + PH - NO WATER
1455 : PULL PROBES - DECU

10/8/05 LUG TBS TRIP - SAMPLING BOD-01-52
T. MOORE

- 1500 BEGIN SAMPLING EQUIPMENT BLANK
LUG-2 - RINSE-6L
- 1530 FINISH SAMPLING EQUIPMENT BLANK DECU
MOB TO SUSA - PREPARE IFF PROBES
- 1535 INSERT IFF PROBES, BEGIN PUMP
- 1545: BEGIN SAMPLING LUG-2-T30-SUSA
- 1630: END SAMPLING SUSA, DECU
- 1640: MOB TO PABOS MARINA
- 1710: ARRIVE PABOS - WAKANA - MOB TO FIELD LAB
- 1750: ARRIVE FIELD LAB
- 1845: LEAVE FIELD LAB

10/8/05
1845 hrs

JA

10/10/05 LUG TBS TRIP - SAMPLING BOD-01-52
T. MOORE

- 0730: ARRIVE FIELD LAB, LABS UP FOR THE DAY
- PERSONNEL: T. MOORE - NIGHT
J. CAWLEY, M. SCHAE, R. POWSON - CMA
- SCOPE: TO BEGIN SAMPLING TBS AT ARKEMA ACID PLANT
USING IFF/SEF THOUGHT PROBES.
- 0810: ALLOW FIELDS MARINA, LABS UP SIGAT FOR THE DAY
- 0845: CMA AT FIELDS, BEGIN ALL EQUIPMENT
CALIBRATE PROBES (ULTRAMETER)
- IFF PROBE - COUS - 1530 m/s
REPLACE PLUG - 1500 m/s
ULTRAMETER - 1546 m/s
ULTRAMETER PH. ORP, TDS
- 0910: MOB TO ARKEMA ACID PLANT, CMA CABIN GEAR
SHUT OFF
- 1000: ON LOCATION ACID PLANT 2A - (AP-2A)
PREPARE IFF PROBES
- 1030: BEGIN SAMPLING LUG-2-T30-AP2A
ALSO SAMPLE LABS QA 3x SAMPLE
- 1150: END SAMPLING IFF AP2A + LABS QA,
DECU + PREPARE IFF/SEF PROBES FOR AP20
- 1210: ARRIVE AT AP20
- 1225: BEGIN PUMPING IFF + SEF PROBES
SPW IS SHOWN
- 1240: BEGIN SAMPLING LUG-2-T30-AP20
- 1300: ABOUT SEF SAMPLE - NO FLOU - WATER QUALITY
COLLECTED, A VERY STRONG PESTICIDE ODOR OBSERVED
- 1350: END SAMPLING IFF SAMPLE - NO FLOU SAMPLE
COLLECTED - NOT ENOUGH PUMPING TO PUSH WATER THROUGH
FILTER

10/10/05 LUG TEL TRIDENT SAMPLING

801-01-52

J. MOORE

1420: ARRIVE AP34. PREPARE IPE + SFE PROBES
1435: BEGIN PUMP OF IPE + SFE

1440

1440: BEGIN SAMPLING LUG2-T30-AP34

1455: BEGIN SAMPLING LUG2-T30-AP34 (V. SLOW)

1515: BEGIN SAMPLING LUG2-T30-AP34-D (DUPLICATE)

1600: END SAMPLING. IPE DUPLICATE AND SFE SAMPLE
NOTE - THE SFE SAMPLE HAS NO FIBER SAMPLE
DUE TO V. POOR FLOW.

1610: BEGIN - MOD TO PRESS MARINA

1700: ARRIVE PRESS UNLOAD CAN CONTAINER / SHELL

1725: MOD TO FIELD LAB

1800: LEAVE FIELD LAB

10/10/05

1805 hrs

JM

801-01-52

J. MOORE

10/10/05 LUG TEL TRIDENT SAMPLING

0730: ARRIVE FIELD LAB. LOAD UP FOR THE DAY

PERSONNEL: J. MOORE, INTEGRA

R. PETERSON, J. GLOVES, M. SCHAN, CMA

SCOPE: TO CONTINUE SAMPLING TEL USING IPE / SFE TRIDENT
PRESS AT THE ARKEMA ACO PLANT.

0800: ARRIVE PRESS MARINA. LOAD SHOOT FOR THE DAY

0840: CMA ARRIVE AT PRESS
CONDUCT ARKEMA SPECIFIC H & S MEETING. FOCUSING
ON THE CONCENTRATION OF THE SITE CONTAMINATIONS,
AND THE NEED FOR EXTRA CAUTION.

0900: CALIBRATE PROBES - ULTRAMETER

1 FT PROBE CONS = 1510 m/s

REFERENCE PROBE = 1600 m/s

ULTRAMETER = 1481 m/s

(1500 m/s STANDARDS)

ULTRAMETER PH ORP TDS

0915: MOD TO ARKEMA ACO PLANT. CAN CRASH GUARD =
SHUT OFF

1010: ARRIVE LOCATION AP30. PREPARE IPE + SFE PROBES

1030: BEGIN PUMP (SAMPLE) IPE PROBE - V. SLOW
LUG2-T30-AP30

1045: BEGIN SAMPLING SFE PROBE, LUG2-T30-AP30

1140: STOP SAMPLING. BOTH IPE + SFE. V. SLOW FLOWS
IPE PROBE SAMPLE - VOC'S + PCB'S + CHLORIDE + CONDUCTIVITY

SFE PROBE SAMPLE - VOC'S + PCB'S + CHLORIDE + CONDUCTIVITY + RESIDUALS

N.G. RUTHERFORD SAMPLES COLLECTED.

1145: BEGIN PROBE - BEGIN AND READ PROBS FOR
R2AP2

1215: ON LOCATION R2AP2

1230: BEGIN PUMP AT R2AP2 (IPE + SFE)

1245: BEGIN SAMPLING IPE PROBE LUG2-T30-R2AP2

10/11/55 LUGL T20 TH-AGENT SAMPLING BOI-01-S12
J. MOORE

1250 : BEGIN SAMPLING R2AP2 SPL PROBE
LUGL T20 - R2AP2

1430 : STOP SAMPLING R2AP2
IRL = AU UNFILTERED SAMPLES + FILTERED
RETAINS

SPL = VOCs metals, residue + concentration
(- NO FILTERED SAMPLES) + RESIDUES

1435 : BEGIN, PREPARE IRL PROBE FOR ARR CHLORATE
PLANT SAMPLING

1500 : ARRIVE CHLORATE PLANT CP-9A, PREP.

1515 : BEGIN SAMPLING IRL PROBE, LUGL-T30-CP9A

1530 : BEGIN SAMPLING IRL DUPLICATE, LUGL-T30-CP9A-D

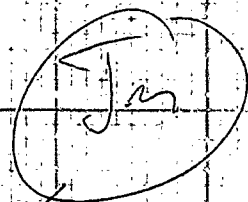
1555 : END SAMPLING CP9A

1600 : BEGIN, MOD TO REEG MARINA

1650 : ARRIVE REEG MARINA - UNLOAD - MOD TO
REEG LAB.

1730 : ARRIVE REEG LAB - UNLOAD

1800 : LEAVE REEG LAB



10/11/55
1600 hrs

10/12/55 LUGL T20 TH-AGENT SAMPLING BOI-01-S12
J. MOORE

0730 : ARRIVE REEG LAB, COME UP FOR THE SAT.
MOD TO REEG MARINA

PERSONNEL : J. MOORE, INTERVIEW
R. PETERSON, T. GLOVES, T. SCHAN, C. MA

SCOPE : TO FINISH ARRUENA CHLORATE PLANT T20 SAMPLING
USING PROBE IRL/SPL PROBE

NOTE : DURING THE WATER COLLECTED FOR RETAINS
JOB, AT LEAST 750 ml

0845 : MOD TO ARRUENA CHLORATE PLANT, CELL CASE
GLASS / SHIELD

0930 : ON LOCATION CP83, PREP IRL PROBE

0935 : BEGIN PULVE

0945 : BEGIN SAMPLING CP83 - LUGL-T30-CP83

1015 : END SAMPLING CP83 - BEGIN, MOD TO CP7D
ALSO SEE PROBE

1025 : ARRIVE CP7D

1100 : BEGIN PULVE (SAMPLING OF LUGL-T90-CP7D)

1215 : END SAMPLING - V. SLOW, ONLY UNFILTERED
SAMPLES COLLECTED

1240 : PULL PROBE - BEGIN, PREP IRL/SPL PROBES

1245 : ARRIVE LOCATION - CP7B, PREP IRL/SPL PROBES

1255 : BEGIN PULVE (SAMPLING LUGL-T30-CP7B)

1300 : BEGIN SAMPLING LUGL-T90-CP7B - V. SLOW

1400 : END SAMPLING IRL - COMPLETE FILTERS + GROSS
ETC - ONLY VOCs + METALS COLLECTED

1405 : PULL PROBES - BEGIN, PREP FOR CP7A

1415 : ARRIVE AT CP7A - PREP

1430 : SAMPLE CP7A - LUGL-T30-CP7A

1505 : END SAMPLING CP7A - BEGIN, MOD TO CP6A

1520 : ARRIVE CP6A - PREP IRL/SPL PROBES

10/12/55 LUG TIDE TERN SAMPLING BOI-01-52
T. MOORE

1670 BEGIN SAMPLING IFF LUGL-T30-CIGA

1645 BEGIN SAMPLING SRT LUGL-T90-CIGA

1610 END SAMPLING IFF PROBE - ALL SAMPLES O-44

1615 END SAMPLING SRT PROBE - UCC & PERCENTAGE
SAMPLES O-44

1630 - NOON MOB TO FREDS MARINA

1510 ALL 3 PROBES - LUGL - MOB TO REFS
CAB

1550 ARRIVE REFS CAB

1820 LEAVE REFS CAB

JM

10/12/55
1830 hrs

10/13/55 LUG TIDE TERN SAMPLING BOI-01-52
T. MOORE

0730 ARRIVE REFS CAB - CAB & REFS THE DAY

PERSONNEL J. MOORE - INTERVIEW

J. GROUT, M. SCHAU, R. PINSKY - CIGA

SCOPE TO SAMPLE AT ARCO, LOCATION

ARCA - T30 & T90

ARCA - T30 & T90

RZAR1 - T30

RZAR2 - T30 & T40

RZAR3 - T30

RZAR4 - T30

0830 ARRIVE FREDS MARINA, DECON TRAIL & CHANGE

ON IN MOTOR - PROBLEMS WITH OUTBOARD

0915 MOB TO ARCO - CAN CARRY GEAR/SHERIFF

& LUG ARCO

1015 ARRIVE AT ARCA, PREP IFF/SRT PROBES

1000 BEGIN PROBING/SAMPLE OF IFF PROBE LUGL-T30-ARCA

1130 ADJUST SRT PROBE - SILT BELOW 2 SRT

1210 FINISH SAMPLING IFF PROBE ARCA

1215 RE-ADJUST PROBE - SRT - MOB TO ARCA

1300 ARRIVE ARCA, PREP PROBES

1310 BEGIN SAMPLING IFF LUGL-T30-ARCA

1320 BEGIN SAMPLING SRT LUGL-T90-ARCA

1350 BEGIN SAMPLING IFF DUPLICATE LUGL-T30-ARCA

1600 END SAMPLING - MOB TO FREDS - DECON

1627 ARRIVE REFS - MOB TO CAB - CAN CARRY GEAR/SHERIFF

1715 ARRIVE REFS CAB - LUGL

1740 LEAVE REFS CAB

1740 hrs
10/13/55

JM

10/17/05 LOG TCU TROGOT SAMPLING BOJ-01-512
J. Moore

0730 ARRIVE FIELD LAB - LOAD UP FOR THE DAY
MOB TO PRESS MARKA

PERMISSION: J. Moore - IN-EGRA
R. Poulson, C. PAKER, M. SCLAFANI - CMA

SCHE TO SET UP JHUAT, AFS TRA - NEW CMA
PERMISSION, COLLECT EQUIPMENT BLANK FOR
ALCO - THEN MOB TO ALCO TO CONTINUE
COLLECTING TCU SAMPLES USING IFF, SEE
TRIDENT PROBES.

0815 ARRIVE PRESS MARKA, MEET PORT

0845 CMA ARRIVE
CONTACT COMPLETE HES MEETING, BEGIN
TRAINING NEW CREW

0932 COLLECT EQUIPMENT BLANK FOR ALCO

1030 MOB TO ALCO - CAN CONTACT GUARD/SHARCK
BUT WILL BE IN SILENCE UNTIL 1100 HS -
BUT CLEAR TO WORK ON NORTH END.

1100 ARRIVE ALCO - LG-ALCO (ONE)

1115 INSERT IFF PROBE, BEGIN R-AGE

1130 BEGIN SAMPLING LG-ALCO - T30 - R2421 AND
LAB QA/QC 3X AMOUNT.

1330 END SAMPLING DECO - MOB TO R2-ARZ

1400 ARRIVE R2-ARZ

1415 SET SEE + IFF PROBES

1420 BEGIN SAMPLING IFF PROBE LG-ALCO - T30 - R2422

1430 BEGIN SAMPLING SEE PROBE (PROBE IS AT SEE
DEPTH) LG-ALCO - T30 - R2422 ALSO TAKE
DUPLICATE SAMPLE LG-ALCO - T30 - R2422 - D.

10/17/05 LOG TCU TROGOT SAMPLING BOJ-01-512
J. Moore

1525 END SAMPLING ALCO R2422 IFF

1600 END SAMPLING ALCO R2422 SEE (SEE DEPTH)

1615 FROM 1435 - DECO - MOB TO PRESS MARKA

1700 ARRIVE FIELD LAB - MEET PORT

1700 ARRIVE FIELD LAB - MEET PORT

1815 LEAVE FIELD LAB

10/17/05
1815

80-01-52 J.M.C.

2012-13

10/18/05

3600 3400 3200 3000 2800 2600 2400 2200 2000 1800 1600 1400 1200 1000 800 600 400 200

4316T 5Ht 84m² 0.7m VOCs AUS 4m²-2cd

145-60000

From 541 - 1900E - 19340 - 1921 1903E

00120 11/11/53 - 1360-12/11/53

1944-1945

31-38221-58-1-2002	3-032418	3-032418
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ADJAC - ADJAC / FT - VOLTS + WATER DRAIN

2700 2700

from 1905 - 1960 - map to F&S Map.

[illegible]

01/11/2019 11:00 AM

LMAC 230 (A3) - the case was / health.

1944

[illegible]

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100-443887-100

7/17/91

20/8/07

57 31

100-443887-27

[illegible]

12

[illegible]

1950年12月15日

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01/19/55 LUG TEN TRIP EST SAMPLING BOI-01-52
 J. MOORE
 0730 ARRIVE REEDS MARINA LEAVE FOR THE CAT
 MOB TO REEDS MARINA
 PERSONNEL: J. MOORE - INTERVIEW
 R. POWLSON, C. SMITH, C. PHELPS, M. SCLAFANI - CMA
 SLOPE: TO FINISH SAMPLING TEN AT UNDER MARGAN
 LINDON TERMINAL, COLLECT LAB DATA SITE
 EQUIPMENT BLANK, Duplicates FOR REF / SEE
 0810 ARRIVE REEDS MARINA DECOM AN EQUIPMENT
 REPAIR FOR EQUIPMENT BLANK
 0850 COLLECT UNDER RIVER EQUIPMENT BLANK
 0930 CALIBRATE PROBES
 REFERENCE PROBE 1600 m/s
 IFE PROBE 1540 m/s
 ULTRASONIC 1524 m/s
 + PH, ORP, TDS
 0950 MOB TO UNDER MARGAN LINDON TERMINAL
 1030 ARRIVE AT UMBA REEDS SITE IFE PROBE
 1055 BEGIN SAMPLING LUG-2-T33-UMBA, THE
 SEC PROBE IS IN A DENSE SILT - V. SLOW
 1110 ABOVE SEC PROBE - NO WATER
 1130 END SAMPLING UMBA IFE
 1140 PULL PROBES - DECOM - MOB TO REEDS
 1150 ARRIVE REEDS - INSERT PROBE - IFE ONLY
 1200 BEGIN SAMPLING IFE LUG-2-T33-REEDS
 AND TWO LAB QC SAMPLES, AND SITE DUPLICATES
 1440 END SAMPLING REEDS - PULL PROBE - DECOM
 1445 MOB TO WILKINSON COBARANCO GULF BY
 CONDORPHILIP TO ACCESS UPSTREAM OF DOCK
 MOB TO REEDS

10/19/55 LUG TEN TRIP EST SAMPLING BOI-01-52
 J. MOORE
 1520 ARRIVE AT REEDS
 1540 BEGIN PULLING OF IFE PROBE
 1545 BEGIN SAMPLING LUG-2-T33-REEDS
 1650 END SAMPLING REEDS, ALL IN FULTON
 SAMPLES COLLECTED, ONLY 15 MINUTES REMAINS
 COLLECTED
 1700 MOB TO REEDS MARINA - CAN CONDORPHILIP
 CONTACT SHELL
 1750 ARRIVE REEDS MARINA - UNDER - MOB TO
 REEDS LAB

1840 ARRIVE PULL LAB
 1910 LEAVE REEDS LAB

(S) K

10/19/55
 1915 Lvs

10/20/05 TCU LUG TRIDENT SAMPLING BS-01-SE J. MOORE

0720 ARRIVE PICO LAB, WAS P FOR THE SAT MOB TO PRESS MARINA

PERSONNEL: J. MOORE - INCHARGE
C. SMITH, C. PICKRETH, M. SCHAPPA, R. POWSON - CMA

0800 TO CONTINUE WITH SAMPLING WILDBLUE TRIBUTARY TCU USING IRT, SPT TRIDENT PROBES

ARRIVE PRESS MARINA, WAS P FOR THE SAT, PREP EQUIPMENT FOR EQUIPMENT

0830 TAKE EQUIPMENT BLANK SAMPLE - WILDBLUE LUG2 - RIBB - W

0910 GO TO EQUIPMENT BLANK - MOB TO WILDBLUE CLEARANCE GIVEN BY CO-ORDINATORS ON EACH SIDE OF THE DOCK - THEN WILL PAUSE FILLING OF DUCK ON PSTREAM SIDE UNTIL WE ARE CLEAR OF DOCKS

CHEVRO - GIVE TENTATIVE CLEARANCE TO ENTER PSTREAM SIDE OF DOCK - DIESEL DUCK LOADING - WE SHALL ASSESS SITUATION PRIOR ARRIVAL TO DOCK AREA

CAN CONST GUARDS + SHUTTER

1000 ARRIVE W9A, SET UP IRT + SPT PROBES

1020 BEGIN PUMP ON IRT + SPT PROBES
BEGIN SAMPLING IRT LUG2-T30-W9A

1040 ADJUST SPT PROBE NO WATER - CLASSIFY

1100 END SAMPLING W9A

1110 PUMP PROBES - DECOM - MOB TO WTC

10/20/05 LUG TRIDENT SAMPLING BS-01-SE J. MOORE

1120 ARRIVE WTC, PREP IRT + SPT PROBES

1140 DECOM IRT PROBE - DECOM SPT, DECOM NOT TO INSERT SPT PROBE DUE TO CLAM CONTENT, AND PLASTICITY OF THE SPT

1150 BEGIN SAMPLING IRT LUG2-T30-WTC

1300 END SAMPLING WTC DECOM - MOB TO UGA

1330 BEGIN SAMPLING UGA - LUG2-T30-WGA IRT SAMPLE - DUE TO FIRM SPT CLAM NO ATTEMPT AT SPT SAMPLE MADE

NOTE: THE SAMPLES IN UGA COCKS HAVE SURFACE WATER INFLUENCE - IN FIRM SPT/CLAM AN OPEN HOLE WILL BE FORMED BY THE TRIDENT PROBES, ALLOWING RIVER WATER TO PUMP DOWN TO THE SCREENS, ALSO FIRM SPT/CLAM IS UNLIKELY TO BE ABLE TO PRODUCE AS MUCH PLE WATER AS IS BEING PUMPED AT THESE LOCATIONS

1415 END SAMPLING UGA IRT SAMPLE - PUMP IRT PROBE - DECOM

1430 MOB TO W12A

1445 ARRIVE W12A, PREP IRT + SPT PROBES

1500 INSERT PROBES - BEGIN PUMP

1515 BEGIN SAMPLING IRT LUG2-T30-W12A SPT PROBE SLOW

1535 ADJUST SPT - NO WATER - SAND ONLY TO 2.5 FE APPROX. FIRM SPT + SAND BELOW

1710 END SAMPLING W12A, PUMP PROBES DECOM - MOB TO PRESS MARINA, CAN CONST GUARDS

1800 ARRIVE PRESS MARINA, MOB TO LAB

1840 ARRIVE PRESS MARINA

1930 LEAVE FIELD CAMP

10/21/05 TZW LWG Trident Sampling B010132 J. Sund

0730 Arrive @ Field lab load up for Day +

Mob to Fred's Marina

0800 Arrive @ Fred's Marina

Personnel: Jane Sund (Integral)

R. Poulson, C. Smith, C. Pike, M. Selafon - CMA

Score: Begin Sampling @ Gundersen starting @ 5A and collecting LAB QC sample (3x unfiltered + one filtered)

0815 CALL COAST GUARD + SHERIFF

CALL DAVE KING - KLEINFELDER FOR

GUNDERSON (HE WILL CONTACT

GUNDERSON. CALL PAT @ LAKESIDE

INDUSTRIES. CLEARANCE TO

SAMPLE - POSSIBLY THERE IS A

BARREL @ LAKESIDE BUT SHOULDN'T INTERFERE)

0832 DEPART FRED'S, MOB TO GUNDERSON

0855 Arrive @ Gundersen, GNSA

SA on pulling on shore on bow + anchor off stern to get position

1005 Set up 1ft + 5ft Probes

1010 Begin Purging 1ft + 5ft Probes, 1ft + 5ft pumping easily.

1025 Collect Sample

LWG2-T30-GNSA + LAB QC @ T30 (3x)

LWG2-T90-GNSA

LWG2-T90-GNSA-D

10/21/05 TZW LWG Trident B010152 J. Sund

1130 END SAMPLING 5ft, T90

1215 END SAMPLING 1ft, T30

PULL UP PROBES + DECON MOB TO GN4A

1250 Set up @ GN4A, 1ft + 5ft Probes. HAD TO DECON TUBING THAT RUNS THROUGH Pump Head as there was no add'l on boat (talked to Joss, he was on board with this)

Begin Purging 5ft probe

1300 Install 1ft probe and begin purging (Noted silt when 1ft probe inserted)

1320 Begin Sampling T30

LWG2-T30-GN4A

LWG2-T30-GN4A-D

1340 Begin Sampling LWG2-T90-GN4A

1510 END Sampling LWG2-T30, GN4A + GN4A-D

Did not collect duplicate of Metals filtered, flow insufficient

1511 END sampling, LWG2-T90-GN4A, Did not collect Metals Filtered, flow insufficient

Pull up probes, decon 5ft probe + mob to next location, GN1E

1535 On location, GN1E, set up 50 probe

1548 Men on Shaver boat notify US that barge needs to pull into dock just South of US, Pull up samplers + move out of area. Shaver commented

10/21/05 TZW LUG Trident

001-01-52
J. SUND

that the barges come in + out of
this area every day (usually barges
stay in for ~12 hrs)

Trident probe bent @ 90° when
pulled up

1553 Mob back to Fred's Marina

1445 Depart Fred's Marina to
Field Lab to store samples

1730 Depart Field Lab

~~BLANK~~

(b) (6)

(b) (6)

10/21/05

10/22/05 TZW LUG TRIDENT SAMPLING

001-01-52
J. SUND

0730 ARRIVE FRED'S MARINA - LUG UP FOR THE DAY - MOB
TO FRED'S MARINA

PERSONNEL: J. MOORE - INTEGRAL
C. SMITH, R. POWELL, C. PICKERSON, M. SCHMIDT - CHA

SCHE: TO COMPLETE SAMPLING TZW AT GUNTERSON
USING IFF/SPE TRIDENT PROBES, THEN BEGIN
SAMPLING RHONE PARELL

0815 ARRIVE FRED'S MARINA - LUG UP BOAT, AND
FIX SPE PROBE AFTER SERIOUS DENS 10/21/05
DECO. AN EQUIPMENT

0900: MOB TO GUNTERSON, CAN GET GUNTERSON
LAKESIDE AND UCCENTENDER - CLEARANCE GUN

1000 ARRIVE GUNIE - SET SPE PROBE

1020 BEGIN SAMPLING SEE LUG 12-730 - GUNIE
U-SLOW

1050: ADJUST SAMPLE - SHAVER DALLIE HEADING RICH
FOR SHIRT

1115 SHAVER DALLIE MOORED - REPOSITION ON GUNIE
AND INJECT PROBE - PULL 1200 - NEW TUBING
OLD TUBING WAS CUT DURING MOORING

1125 BEGIN SAMPLING SEE AGAIN LUG 12-730 - GUNIE

1200 END SAMPLING GUNIE - ALL SAMPLES COLLECTED
- PULL PROBE, DECO. MOB TO RHONE PARELL

1220 ARRIVE RZRP3 - INJECT IFF PROBE

1240 BEGIN SAMPLING LUG 12-730 - RZRP3

1315 END SAMPLING - PULL PROBE MOB TO FRED'S MARINA

1415 ARRIVE FRED'S MARINA - MOB TO FRED'S LAB

1520 ARRIVE FRED'S LAB

1630 LEAVE FRED'S LAB

~~TRIDENT~~ 10/21/05

10/14/65 LUG T22 TRASH SAMPLING BOI 0152
J. MOORE

0730 ARRIVE FIELD LAB - LUG T22 FOR THE DAY
MOB TO PRESS MAR-A

PERSONNEL J. MOORE - INTEGRAL
M. SCHAFER - C. SMITH - E. PICKERSON - CMA

SCOPE TO COLLECT SITE EQUIPMENT BLANKS AND
BELOW SAMPLING CASCO T22 GASCO SFG AND
IF TRASH PROBES

0800 ARRIVE PRESS MAR-A - LUG T22 FOR THE DAY

BELOW AN EQUIPMENT AND BELOW COLLECTION
EQUIPMENT BLANKS FOR RAINIE RAINCEN AND
CUMOBELSON

0915 MOB TO CASCO - CLEARANCE TO WORK ON
SOUTH END OF SITE - CAN - CASH CLARK / HERRICK

1030 ARRIVE AT CASCO GS8A

1100 BELOW SAMPLING IF PROBE LUG2-T22-GS8A
ALSO SAMPLE GAS QC 3X AMOUNT

1240 END SAMPLING GS8A

1245 FROM PROBES DECON MOB TO GS8D

1300 INSERT IF & SFG PROBES AT GS8D

1315 BEGIN SAMPLING IF LUG2-T22-GS8D

1320 BEGIN SAMPLING SFG LUG2-T22-GS8D

1450 END SAMPLING IF GS8D

1500 END SAMPLING SFG GS8D - NO FILTERS SAMPLES
COLLECTED

1505 FROM PROBES DECON MOB TO GS7D

PROBLEMS WITH ON BOARD GPS

1520 DECON TO MOB TO PRESS MAR-A

1630 ARRIVE FIELD LAB - MOB TO PRESS MAR-A

1730 ARRIVE FIELD LAB

1800 LUG T22 TRASH SAMPLING

JM

10/25/65 LUG T22 TRASH SAMPLING BOI 0152
J. MOORE

0730 ARRIVE FIELD LAB - LUG T22 FOR THE DAY
MOB TO PRESS MAR-A

PERSONNEL J. MOORE - INTEGRAL
C. SMITH - E. PICKERSON - M. SCHAFER - CMA

SCOPE COMPLETE SAMPLING T22 AT GASCO LUG
IF / SFG PROBE PROBES - COLLECT CASCO EQUIPMENT
BLANK

0810 ARRIVE PRESS MAR-A - PREP FOR EQUIPMENT
BLANK

0820 COLLECT CASCO EQUIPMENT BLANK LUG2-RISE-GS

0920 MOB TO CASCO - CAN - T. STONE - ANGLER &
CASH CLARK + SHOLIFF

1010 ARRIVE CASCO GS7D - PREP SFG PROBES

1015 PROBES INSERTED BELOW PUDGE

1040 BEGIN SAMPLING LUG2-T22-GS7D

1100 DRAIN VIALS COLLECTED (VOC & GAS) - ABSOR
SAMPLING AFTER WATER QUALITY COLLECTED

1115 FROM SFG PROBES DECON - MOB TO GS7B

1125 ONSITE AT GS7B - PREP IF & SFG PROBES

1140 INSERT SFG & IF PROBES

1200 BEGIN SAMPLING IF LUG2-T22-GS7B

1225 ADJUST SFG PROBE - NO WATER FROM SFG
- SCREENS FILLED WITH TANK SEDIMENT

1330 END SAMPLING IF - NO FILTERS SAMPLES NOT
ENOUGH PRESSURE TO PUMP THROUGH FILTER
- FROM PROBES - FINISH TANK - REPLACE SCREENS
- MOB TO GS2A

1350 ARRIVE GS2A - PREP IF PROBE

1410 BEGIN PURGE

1445 BEGIN SAMPLING IF - LUG2-T22-GS2A + DILUTION

10/27/05 LUG TERN TRAP SET SAMPLING BDI-01-52 J. MOORE

0730: ARRIVE FRESH LAB - LOAN UP FOR THE DAY
MOB TO BRESS MARINA

PERSONNEL: J. MOORE - INTEGRAL
C. SMITH - C. AMERSON M. SCHAFER - CNA
M. CHASWICK

SCHE: TO COMPLETE PHONE LOGS FOR TERN SAMPLING
USING SET & IRE TRAPNET PROBES

0810: ARRIVE FRESH MARINA, LOAN UP BAY & BEGIN
ALL EQUIPMENT

CALIBRATE PROBES & ULTRAMETER

PERFECTED PROBE 1600 n/s

IRE PROBE 1550 n/s

ULTRAMETER 1578 n/s

(1500 n/s - CONS. STANDARD)

+ ULTRAMETER PH. TDS DRP

0840: MOB TO RHINE POND ON CANE CANYON / SHORE

0900: ARRIVE R.P.E. - PREP IRE & IAG PROBES

0950: BEGIN SAMPLING IRE LUG2-T90-RP2E ONLY
BOWMAN PROBES TO DO ONE PROBE AT A TIME

1050: END SAMPLING IRE PREP S.R.

1100: BEGIN SAMPLING S.R. LUG2-T90-RP2E

1200: END SAMPLING S.R. RP2E - PULL PROBES

DELOU - STRONG HERMIDOG OODR

1215: ARRIVE RP2E, INSURE IRE PROBE

1235: BEGIN SAMPLING IRE LUG2-T90-RP2E

1345: END SAMPLING IRE SAMPLES - NO FURTHER COLLECTED
V. SLOW

1350: PULL IRE, DELOU

1400: INOBER S.R. PROBE

10/27/05 LUG TERN TRAP SET SAMPLING BDI-01-52 J. MOORE

1415: BEGIN SAMPLING S.R. LUG2-T90-RP2E

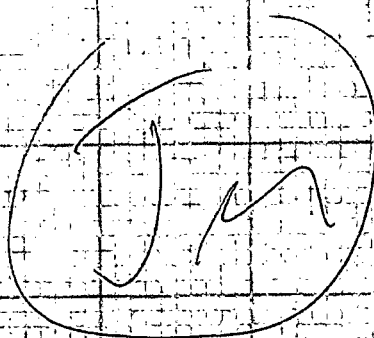
1545: END SAMPLING S.R. - ALL SAMPLES COLLECTED

1550: PULL PROBE - DELOU - MOB TO FRESH MARINA
CALL CANT. CANYON / SHORE

1630: ARRIVE FRESH MARINA - UNLOADS, MOB TO
FRESH LAB

1730: LEAVE FRESH LAB

1730 L
- 10/27/05



10/18/05 LUL TEL TADOUT SAMPLING BOI: 5152
J. MOORE

0730 : ARRIVE FISH LAB, WAS W. R.R. THE SKY.
MOB TO REES MARINA

PERSONNEL : J. MOORE - INCHARGE
C. SMITH, C. PICKERIN, M. CHASWICK - CMA

SOURCE : TO CO-PILOT LULTE POLICE TEL SAMPLING
USING SFT + IFT THROB PROBS

0800 : ARRIVE REES MARINA, LAND P. SHUTT

0820 : CALIBRATE PROBER + ULTRAMETER

POLYMER COND. : 1600 m/s

IFT PROBE COND. : 1500 m/s

ULTRAMETER COND. : 1520 m/s

+ PH, TDS, ORP

0840 : MOB TO ARIVE POLICE (LAN. GAST) GARA
+ SHUTTL.

0925 : ARRIVE RP3C, PROBER IFT/SFT PROBER

0945 : BEGIN SAMPLING IFT LULTE-TSD-RP3C

1000 : END SAMPLING IFT - PREP SFT

1125 : BEGIN SAMPLING SFT LULTE-TSD-RP3C

1240 : END SAMPLING SFT, PULL PROBE - DECON
IN EQUIPMENT MOB TO REES MARINA

1330 : ARRIVE REES MARINA, MOB TO FISH LAB
COMPLETE FINAL DEMOS

1430 : ARRIVE FISH LAB

1530 : LEAVE FISH LAB

JM

10/18/05
1576 hrs

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 1 of

Date: 10/3/05

Field Crew: J. M. Dore, R. Chaudhri, J. G. Jones, M. Schall

Site: ExxonMobil

Station ID: E2-Em1

Coordinates: 45 35.506 N 122 46.536 W

Sample Type: (real) calibration

Time: 1515

Photo No.:

Water Depth (m): 7.2 ft

Sediment Texture ("feel"): Silt & sand

Sediment Core Description:

Notes: UltraMeter Temp. 16.0 C
Cond. 651.5 μ S/cm
TDS 454.6 ppm
Turbidity 53.7 NTU

Screening Sample: collected not collected

Screening Sample ID: LWG2-T30-E2Em1

Purge Rate: 80 ml/min

Screening Sample Analytes: PAH / DRB / CONVENTIONAL
VOC / TPH / METALS

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>15.657</u>	<u>0.100</u>
30 cm	<u>16.815</u>	<u>0.780</u>
60 cm	<u> </u>	<u> </u>

* 250 ml purged prior to sampling

10/4/05 Station ID: EM8-A

Coordinates: 45 59207 N -122.72623 W

Sample Type: (real) calibration

Time: 0944

Photo No.:

Water Depth (m): 3.2

Sediment Texture ("feel"): Sand with silt

Sediment Core Description:

Notes: TDS 309.1 ppm
Cond. 442.9 μ S/cm
Turb. 35.8 NTU
pH 6.3

Screening Sample: collected not collected

Screening Sample ID: LWG2-T30-EM84

Purge Rate: 100 ml/min

Screening Sample Analytes: PAH / DRB / CONVENTIONAL
VOC / TPH / METALS

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>15.444</u>	<u>0.100</u>
30 cm	<u> </u>	<u> </u>
60 cm	<u>16.458</u>	<u>0.286</u>

* 250 ml purged prior to sampling

Initials: JM

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 2 of

Date: 10/04/05

Field Crew: J. MOORE, D. CHADWICK, M. CHADWICK, J. GOVES, M. SCHAW

Site: Exxon

Station ID: EM6-B

Coordinates: 45.59262 N -122.77665 W

Sample Type: real calibration

Time: 1240

Photo No.:

Water Depth (m): 11.6'

Sediment Texture ("feel"): Soft SILT.

Sediment Core Description:

Notes: Temp: 15.6°C
TDS: 319.0
Cond.: 459.3
pH: 6.0
Turb.: 29.2

Screening Sample: collected not collected

Screening Sample ID: LWG-2-T30-EM6B

Purge Rate: 100 ml/min

Screening Sample Analytes: PAH/DBP/CONV. METALS
TPH/DOC

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.480	0.100
30 cm		
60 cm	16.472	0.490

* 250 ml purged prior to sampling.

Station ID: EM5-A

Coordinates: 45.59592 N -122.77642 W

Sample Type: real calibration

Time: 1420

Photo No.:

Water Depth (m): 9.7'

Sediment Texture ("feel"): Soft SILT - TRACE SAND - FINE SILT
BELOW 2ft.

Sediment Core Description:

Notes: TDS: 605.7
Cond.: 858.5
pH: 6.4
Temp: 16.0
Turb.: 74.8 NTU

Screening Sample: collected not collected

Screening Sample ID: LWG-2-T30-EM5A

Purge Rate: 70 ml/min

Screening Sample Analytes: PAH/DBP/CONV.
METALS/TPH/DOC

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.595	0.100
30 cm		
60 cm	16.774	0.440

* 250 ml purged prior to sampling
 - NO SFT SAMPLE
 Initials: JM

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 3 of

Date: 10/5/25

Field Crew: J. NOBLE, M. CHAMBERLAIN, D. CHAMBERLAIN, T. CHAMBERLAIN, M. SCHAU

Site: EXXON MOBIL

Station ID: EM4C Coordinates: 45.59320 N -122.77705 W

Sample Type: real calibration

Time: 0915 Photo No.:

Water Depth (m): 29.8

Sediment Texture ("feel"): SILT & SAND AT 1ft SAW SILT AT 4ft

Sediment Core Description:

Notes: Temp: 14.9
TDS: 1073
Cond: 1482
pH: 6.0
Turbidity: 82.8

Station ID: EM4A Coordinates: 45.59308 N -122.77717 W

Sample Type: real calibration

Time: 1218 Photo No.:

Water Depth (m): 19.3

Sediment Texture ("feel"): SAND & SILT

Sediment Core Description:

Notes: Temp: 16.2
TDS: 454.6
Cond: 651.4
pH: 6.6

Screening Sample: collected not collected

Screening Sample ID: EM4C-T30-190 (EM4C)

Purge Rate: 60 ml/min

Screening Sample Analytes: Full Suite

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.330	0.100
30 cm		
60 cm	16.811	1.250

Screening Sample: collected not collected

Screening Sample ID: EM4A-T30-190 (EM4A)

Purge Rate: 100 ml/min

Screening Sample Analytes: Full Suite

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.360	0.100
30 cm		
60 cm	16.871	0.356

Initials: JM

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 4 of

Date: 10/5
 Field Crew: J. Moore, M. Schaw, M. Chadwick, D. Chadwick, J. Groves
 Site: Exxon

Station ID: EM3-A Coordinates: 45.59333 N -122.77745 W
 Sample Type: real calibration
 Time: 1351 Photo No.:
 Water Depth (m): 5.4'

Sediment Texture ("feel"): "Sand" C silt

Sediment Core Description:

Notes: Turb.: 7.72
Temp.: 17.7 18.3
TDS: 298.1 433.7
Cond.: 432.3 625.0
pH: 6.5

Screening Sample: collected not collected
 Screening Sample ID: 262-130/401-EM3A
 Purge Rate: 30 m/min (CFL)
 Screening Sample Analytes: F.M. site

Trident Readings:		
	Temp (°C)	Cond. (mS/cm)
Reference	15.696	0.100
30 cm		
60 cm	16.491	0.229

Station ID: EM2C Coordinates: 45.59352 N -122.77745 W
 Sample Type: real calibration
 Time: 1031 Photo No.:
 Water Depth (m): 20-1

Sediment Texture ("feel"): Sandy (hard)

Sediment Core Description:

Notes: 30cm
Turb.: 74.6 0' probe "no-go"
Temp.: 18.6
TDS: 348.0
Cond.: 519.3
pH: 6.71
ORP: -86

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Trident Readings:		
	Temp (°C)	Cond. (mS/cm)
Reference	18.370	0.100
30 cm		
60 cm	16.412	0.545

Initials:

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 5 of

Date: 10/06/05

Field Crew: J. Moore, M. Schaw, J. Groves, D. Chadwick, M. Chadwick

Site: EXXON

Station ID: EM2-A

Coordinates: 45.59347 N -122.77758 W

Sample Type: real calibration

Time: 1221

Photo No.:

Water Depth (m): 6.1'

Sediment Texture ("feel"): Sand

Sediment Core Description:

Notes: 30cm ↓
Turb: 16.8 5' no good
Temp: 16.0
TDS: 199.4
Cond: 305.0
pH: 7.07 ORP: -66

Station ID: EM1-A

Coordinates: 45.59373 N -122.77772 W

Sample Type: real calibration

Time: 1351

Photo No.:

Water Depth (m): 2'

Sediment Texture ("feel"): sand all the way

Sediment Core Description:

Notes: 30cm 30cm 5'
Turb: 48.2 pH: 7.02 Turb: 2.77 pH: 6.65
Temp: 17.0 ORP: -45 Temp: 16.7 ORP: -75
TDS: 118.8 TDS: 275.5
Cond: 183.9 Cond: 416.5

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond. (mS/cm)
Reference	15.481	0.100
30 cm		
60 cm	16.338	0.580

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond. (mS/cm)
Reference	15.581	0.100
30 cm		
60 cm	16.365	0.210

Initials:

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 6 of

Date: 10/07/05

Field Crew: J. Moore, M. Schaw, M. Chadwick, D. Chadwick, J. Groves

Site: Silfronics

Station ID: SLI3-A

Coordinates: 45.57873 N -122.75483 W

Sample Type: (real) calibration

Time: 1006

Photo No.:

Water Depth (m): 3.9'

Sediment Texture ("feel"): firm sand

Sediment Core Description:

Notes: Twb: 12.5 ORP: -49
Temp: 15.8
IDS: 275.6
Cond: 416.3
pH: 6.66

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.260	0.100
30 cm		
60 cm	16.098	0.650

Station ID: SLI2-A

Coordinates: 45.57890 N -122.75540 W

Sample Type: real calibration

Time: 1245

Photo No.:

Water Depth (m): 7.2'

Sediment Texture ("feel"): 5' silty sand 30 cm = " "

Sediment Core Description:

Notes: Twb: 23.2 pH: 6.81
Temp: 16.5 ORP: -89
IDS: 282.0
Cond: 425.9

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.347	0.100
30 cm		
60 cm	16.036	0.810

Initials:

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 8 of

Date: 10/08/05

Field Crew: J. Moore, M. Schow, P. Chadwick, M. Chadwick, J. Garous

Site: Siltrocks

Station ID: SLT4-A

Coordinates: 45.57845 N -122.75422 W

Sample Type: real calibration

Time: 1235

Photo No.:

Water Depth (m): 3.5'

Sediment Texture ("feel"): 1' Sand 8' Silt

Sediment Core Description:

Notes: 30cm 5'
Turb: 20.4 pH: 6.86 Turb: 127 ORP: -93
Temp: 14.6 ORP: -89 Temp: 14.5
IDS: 256 IDS: 866.0
Cond: 387.4 Cond: 1262
* 5' only went in 3' pH: 6.73

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.214	0.100
30 cm		
60 cm	16.047	0.571

Station ID: SLT5-A

Coordinates: 45.57828 N -122.75375 W

Sample Type: real calibration

Time: 1530

Photo No.:

Water Depth (m): 4.0'

Sediment Texture ("feel"): Sand

Sediment Core Description:

Notes: 30cm
Turb: 42.5 pH: 6.85
Temp: 15.3 ORP: -104
IDS: 576.5
Cond: 853.0

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.113	0.100
30 cm		
60 cm	16.024	0.790

Initials: SGG

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 4 of

Date: 10/10/08

Field Crew: J. MORE, J. GROSS, M. SCHAU, R. PONDSON

Site: AKENA A.C.S.P.

Station ID: AP-2A

Coordinates: 45.57200 N 122.74337 W

Sample Type: real calibration

Time: 1027

Photo No.:

Water Depth (m): 3.7'

Sediment Texture ("feel"): SILTY SAND 1' DEPTH

Sediment Core Description:

Notes: TURB: 3.45 NTU PH: 6.68 1' DEPTH

TEMP °C: 14.5 DRP: -120

TDS: 797.6 1027 HRS

COND: 11.59 µS

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.551</u>	<u>0.100</u>
30 cm		
<u>30</u> 60 cm	<u>15.802</u>	<u>0.870</u>

Station ID: AP-2D

Coordinates: 45.57217 N 122.74308 W

Sample Type: real calibration

Time: 1252

Photo No.:

Water Depth (m): 19.7'

Sediment Texture ("feel"): 1' SILT, 5' SILT

Observations: ONLY COLLECTED LOWEST QUALITY FROM 5' PROBE - FLOW SLOW

30 cm	5'
Notes: <u>TURB: 40.9 NTU PH: 6.47</u>	<u>TURB: 49.6 NTU PH: 6.49</u>
<u>TEMP °C: 16.24 DRP: -105</u>	<u>TEMP: 15.2 °C DRP: -86</u>
<u>TDS: 3360 ppm</u>	<u>TDS: 4078 ppm</u>
<u>COND: 4408 µS 1252 HRS</u>	<u>COND: 5.254 µS 1300 HRS</u>

Screening Sample: collected not collected -5'

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.480</u>	<u>0.100</u>
30 cm		
<u>30</u> 60 cm	<u>16.209</u>	<u>2.240</u>

5' 15.2 5.254 (not collected)

Initials: JS
GS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 10 of

Date: 10/10/05

Field Crew: J. MOORE, J. BROWN, M. SCHWAB, R. PAULSEN

Site: ARKEMA ACID PLANT

Station ID: AP-3A

Coordinates: 45.57170 N 122.74283 W

Sample Type: real calibration

Time:

Photo No.:

Water Depth (m):

Sediment Texture ("feel"): 1' COARSE GRAINED SAND V

Sediment Core Description: 5' ~~SAND~~ TOP 2' SAND BELOW SILTY

COARSE SAND

30 cm	5'
Notes: TURB: 11.1 NTU	TURB: 84.4
pH: 6.70	pH: 7.03
TEMP: 16.2	TEMP: 15.8
ORP: -120	ORP: -102
TDS: 5121 PPM	TDS: 12.48 PPT
COND: 64.80 MS	COND: 14.32 MS
1535 MS	1458 MS

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.560	0.100
30 cm		
60 cm	15.655	2.150

5' 15.8 14.32 MS

Station ID: AP-3D

Coordinates: 45.57192 N 122.74263 W

Sample Type: real calibration

Time: 10:37

Photo No.:

Water Depth (m): 24'

Sediment Texture ("feel"): SILTY SAND FOR BOTH PL. SAMPLERS

Sediment Core Description: SILTY SAND FOR BOTH

30 cm 5'

30 cm	5'
Notes: TURB: <u> </u>	TURB: <u> </u>
pH: <u> </u>	pH: <u> </u>
TEMP: <u>15.509</u>	TEMP: <u> </u>
ORP: <u> </u>	ORP: <u> </u>
TDS: <u> </u>	TDS: <u> </u>
COND: <u>3393</u>	COND: <u> </u>

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.170	0.100
30 cm		
60 cm	15.369	3.373

WATER QUALITY NOT DONE
IN FIELD

Initials:
10/10

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 11 of

Date: 10/11/05

Field Crew: JOSS M., ADRI P., MIKE S., JON G

Site: BAKEMAN ACID PLANT / CALORATE PLANT

Station ID: R2-AP-2

Coordinates: 45.57122 N 122.74197 W

Sample Type: real calibration

Time: 1212

Photo No.:

Water Depth (m): 10.5

Sediment Texture ("feel"): 1' - SOFT SILT, 5' - SOFT SILT

Sediment Core Description:

Notes:	
<u>30 cm</u>	<u>5'</u>
TURB: 90.2 NTU PH: 7.33	TURB: 84.3 PH: 7.47
TEMP: 14.8°C ORP: -112	TEMP: 15.2 ORP: -81
TDS: 48.55 PPT	TDS: 41.25
COND: 45.38	COND: 39.51

Station ID: CP-09-A

Coordinates: 45.569783 N 122.740283 W

Sample Type: real calibration

Time: 1518

Photo No.:

Water Depth (m): 3'

Sediment Texture ("feel"): SILTY SAND

Sediment Core Description:

Notes:	
<u>30 cm</u>	
TURB: 14.5 NTU PH: 7.50	
TEMP: 17.0°C ORP: +38	
TDS: 27.95 PPT	
COND: 28.60 TIME: 1518	

Screening Sample: collected not collected

Screening Sample ID: PARTIAL

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.560</u>	<u>0.100</u>
30 cm	<u> </u>	<u> </u>
<u>G</u> 60 cm	<u>16.618</u>	<u>6.578</u>

DID NOT SAMPLE: R2-AP-1
AP-04-C

ONLY COLLECTED PARTIAL SAMPLES

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.524</u>	<u>0.100</u>
30 cm	<u> </u>	<u> </u>
<u>G</u> 60 cm	<u>13.951</u>	<u>16.072</u>
	<u>16.072</u>	<u>13.951</u>

Initials:

CSG

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 12 of

Date: 10/12/05

Field Crew: JOSS M., MIKE S., RON P., JON G.

Site: ARKEMA - CHLORATE PLANT

Station ID: CP-08B

Coordinates: 45.57007 N 122.74062 W

Sample Type: real calibration

Time: 0945

Photo No.:

Water Depth (m): 4.1

Sediment Texture ("feel"):

Sediment Core Description: SILT 12/SANDY (SANDY SILT)

Notes: 30cm

TURB: 7.91 PH: 6.52

TEMP: 13.4 ~~TEMP:~~

TDS: 36.67 PPT ORP: 61

COND: 35.64 TIME: 0945

Station ID: CP-07-D

Coordinates: 45°34.226 N 122°44.444 W

Sample Type: real calibration

Time: 1133

Photo No.:

Water Depth (m): 22.7'

Sediment Texture ("feel"): SOFT SILT

Sediment Core Description:

Notes: 5' TURB: 3.66 NTU PH: 5.79

TEMP: 13.6 ORP: 79

TDS: 167.1 PPT

COND: 106.2 TIME: 1133

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.231</u>	<u>0.100</u>
30 cm	<u> </u>	<u> </u>
60 cm	<u>15.892</u>	<u>11.046</u>

METALS
COLLECTED:

900 mL FILTERED METALS

900 mL UNFILTERED METALS

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

* COLLECTED 750 mL UNFILTERED METALS

Trident Readings: NOT DEPLOYED HERE

	Temp (°C)	Cond (mS/cm)
Reference	<u> </u>	<u> </u>
30 cm	<u> </u>	<u> </u>
60 cm	<u> </u>	<u> </u>

COLLECTED 900 mL FILTERED
900 mL UNFILTERED

Initials:

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 13 of

Date: 10/12/05

Field Crew: T. MOORE, RON PAULSEN, MIKE S., JON G.

Site: ARKOMA-CHLORATE PLANT

Station ID: CP-07-B

Coordinates: 45.57033 N 122.74085 W

Sample Type: (real) calibration

Time: 1310

Photo No.:

Water Depth (m): 13.5'

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Sediment Texture ("feel"): TOP 9" SILT - THEN SAND? (MAYBE FINE)
TOP 12" SOFT SILT - TO 3' SOFT - RESISTANCE/LAYERS
VERY TO 4'

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.331	0.100
30 cm		
60 cm	16.102	11.953

Notes:

<u>30 cm</u>	<u>5'</u>
TURB: 20.8 NTU pH: 6.46	TURB: 1.675 NTU pH: 6.90
TEMP: 14.7 ORP: +5	TEMP: 15.1 ORP: +53
TDS: 42.87 PPM	TDS: 32.82 PPM
(MMS) COND: 44.80 TIME: 1310	COND: 32.54 MMS TIME: 1315

* METALS

VOL COLLECTED: 1L @ 30 CM FILT
1L @ 30 CM UNFILT
500ml @ 20 CM UNFILT.

Station ID: CP-7A

Coordinates: 45.57030 N 122.74093 W

Sample Type: (real) calibration

Time: 1442

Photo No.:

Water Depth (m): 8.0'

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Sediment Texture ("feel"): SANDY

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.589	0.133
30 cm		
60 cm	15.845	9.303

Notes:

<u>30 cm</u>	<u>5'</u>
TURB: 20.8 NTU pH: 6.78	TURB: <u> </u> pH: <u> </u>
TEMP: 14.9 ORP: +30	TEMP: <u> </u> ORP: <u> </u>
TDS: 35.78 PPM TIME: 1442	TDS: <u> </u> TIME: <u> </u>
COND: 35.02 1442 MMS	COND: <u> </u> TIME: <u> </u>

VOL COLLECTED: 1L UNFILTERED
* METALS 1L FILTERED
Initials:

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 15 of

Date: 10/13/05

Field Crew: J. MOORE, RON P., MIKE S., JON B.

Site: HOCO

Station ID: AR-2A

Coordinates: 45.59598 N 122.77998 W

Sample Type: real calibration

Time: 1114

Photo No.:

Water Depth (m): 1'

Sediment Texture ("feel"): SILTY SAND w/ AGGREGATE (1')

Sediment Core Description:

30 cm		5' ABOLVED	
Notes:			
TURB: 95.3	PH: 6.67	TURB:	PH:
TEMP: 14.1	ORP: -99	TEMP:	ORP:
TDS: 358.5 PPM		TDS:	
COND: 536.8 μ S	TIME: 1114	COND:	TIME:

Station ID: AR-1A

Coordinates: 45.59598 N 122.77998 W

Sample Type: real calibration

45.59615 122.78028

Time: 1313

Photo No.:

Water Depth (m): 1' AT WATER'S EDGE

Sediment Texture ("feel"): 1' SANDY/GRAVEL / 2'-4' SANDY SILT / >4' CLAY w/ SAND

Sediment Core Description:

30 cm		5'	
Notes:			
TURB: 321.4 NTU	PH: 6.49	TURB: 41.2	PH: 6.41
TEMP: 14.5	ORP: -37	TEMP: 14.3	ORP: -68
TDS: 232.8 PPM		TDS: 696	
COND: 352.4 μ S	TIME: 1310	COND: 1020 μ S	TIME: 1307

Screening Sample: collected not collected 5'

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:		Temp (°C)	Cond (mS/cm)
Reference		NA	NA
30 cm			
60 cm		15.654	0.213

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:		Temp (°C)	Cond (mS/cm)
Reference		NA	NA
30 cm			
60 cm		15.796	0.670

Initials: GTG

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 16 of

Date: 10/17/05

Field Crew: Joss M, Ken P, Chris P, Mats

Site: R2 AR-1 AR00

Station ID: R2 AR-1

Coordinates: 45.59545 N -122.77952 W

Sample Type: real calibration

Time: 1122

Photo No.:

Water Depth (m): 6"

Sediment Texture ("feel"): Sandy

Sediment Core Description:

Notes: 30 cm sample only w/ Duplicates

Turb 9.03 NTU ORP -98

Temp 16.8 TDS 604 ppm

Cond 895 uS

Ph 6.53 Time 1140

Station ID: R2 AR-2

Coordinates: 45.59503 N -122.77905 W

Sample Type: real calibration

45 35.7026 122 46.7438

Time: 1413

Photo No.:

Water Depth (m): 8"

Sediment Texture ("feel"): 1' sand silt/clay sand 3-5 silt

Sediment Core Description: 0-1 1-3 3-5

Notes: 3'

30 cm + 3' samples & probe pulled to

3' for sample

Dup collected on 90 cm

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u> </u>	<u> </u>
30 cm	<u> </u>	<u> </u>
60 cm	<u>15.893</u>	<u>.420</u>

B shoreline Reference probe
not in water

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>NA</u>	<u> </u>
30 cm	<u> </u>	<u> </u>
60 cm	<u>15.863</u>	<u>0.490</u>

30 cm 3'
Cond 642 uS 642 uS
Temp 17.6 17.6
Ph 6.67 6.81
ORP -90 -36
TDS 428 ppm 428 ppm
Turbid 7.21 9.21 NTU

Initials: MP

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 17 of

Date: 10/19/05
 Field Crew: JOHN M, CHRIS P, CHRIS S, MARK S, RON P, SHANE
 Site: ARCO R2-AR-3

Station ID: R2-AR-3 Coordinates: 45.594452 N -122.77965 W
45° 35.6716' -122° 46.7198'
 Sample Type: real calibration
 Time: 0945 AM Photo No.:
 Water Depth (m): 10"

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Sediment Texture ("feel"): SAND with RIP RAP

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u> </u>	<u> </u>
30 cm	<u>15.446</u>	<u>0.140 mS/cm</u>
60 cm	<u> </u>	<u> </u>

Notes: 30 cm sample
Turnback 32.6 mV ORP -20 mV
Temp 14.9
COND 195.8 uS TDS 100.5 ppm
pH 6.22 TIME 10:15

Station ID: R2-AR-4 Coordinates: 45.59420 N -122.77925 W
45° 35.6670' -122° 46.6955'
 Sample Type: real calibration
 Time: 11:35 Photo No.:
 Water Depth (m): 4.5'

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Sediment Texture ("feel"): HARD SAND

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>15.049</u>	<u>0.100</u>
30 cm	<u>15.236</u>	<u>0.240 mS</u>
60 cm	<u> </u>	<u> </u>

Notes: 30 cm
Turnback 9.25 ORP -90
Temp 15.9
COND 343.5 uS TDS 259.9
pH 6.65 TIME 11:43

Initials: CPS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 18 of

Date: 10/19/05
 Field Crew: Jesse M. Clark, Chris S. Clark, Tom P. Clark
 Site: Kinder Morgan

Station ID: R2-KM2 Coordinates: 45.60397°N -122.78543°W
 Sample Type: real calibration 45° 36.2317 -122° 47.1514
 Time: 1430 Photo No.: 1262
 Water Depth (m): 36'

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Sediment Texture ("feel"): soft silt with depressions
 Sediment Core Description: 30cm sample

Trident Readings: Time 1437

	Temp (°C)	Cond. (mS/cm)
Reference	<u>14.650</u>	<u>0.100</u>
30 cm	<u>15.636</u>	<u>0.991</u>
60 cm		

Notes: 30cm ORP -104
Turbidity 92.8
Temp 14.1 TDS 797.4
COND 1160 uS
pH 6.82 TIME 1520

Note: 5' sample taken on boat
Worked at VOA + VLF-16
sample taken

Station ID: R2-KM-8A Coordinates: 45.60773°N -122.78595°W
 Sample Type: real calibration 45° 36.2249 -122° 47.1514
 Time: 10:15 Photo No.:
 Water Depth (m): 2'

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Sediment Texture ("feel"): 0-2 SAND 2-4' SAND silt/clay
 Sediment Core Description: 30cm + 4' water samples
(not pushed in the water)

Trident Readings:

	Temp (°C)	Cond. (mS/cm)
Reference	<u>14.650</u>	<u>not in water</u>
30 cm	<u>15.293</u>	<u>0.720</u>
60 cm		

Notes: 30cm ORP -47
Turbidity 3.23
Temp 15.1 TDS 385.4
COND 577.5 uS
pH 6.79 TIME 10152

Initials: CPS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 19 of

Date: 10/19/05

Field Crew: JOSS M, RAN P, CHAP B, CHAP P, MATH S

Site: KINDY - MORGAN

Station ID: R2-KM-1

Coordinates: 45.603921 N -122.78602 W

Sample Type: (real) calibration

45° 36.2350 -122.47.1611

Time: 1153

Photo No.:

Water Depth (m): 1'

Sediment Texture ("feel"): Gravelly SAND

Sediment Core Description:

Notes: 30 cm

ORP -47

Turbidity 3.23

Temp 15.1

TDS 385.9

Cond 577.5 uS

pH 6.79

Time 1052

Willbridge

Station ID: R2-W-2

Coordinates: 45.56525 N -122.73782 W

Sample Type: (real) calibration

45° 33.9166 -122° 44.2699

Time: 1520

Photo No.:

Water Depth (m): 15.7'

Sediment Texture ("feel"): SANDY SILT

Sediment Core Description:

Notes: 30 cm

ORP -105 mV

Turbidity 34.2

Temp 15.8

TDS 1304 ppm

Cond 1859 uS

pH 6.68

Time 1545

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>out of water</u>	
30 cm	<u>16.137</u>	<u>0.350 mS</u>
60 cm		

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>19.810</u>	<u>0.100</u>
30 cm	<u>15.449</u>	<u>1.128</u>
60 cm		

Initials: LF5

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 20 of

Date: 10/20/05
 Field Crew: Joss M., Ron P., Chris S., Chris P., Matt S.
 Site: W-09-A Willbridge

Station ID: W-09-A Coordinates: 45.56567N -122.73043W
 Sample Type: (real) calibration 45.56567N -122.73043W
 Time: 10:30 Photo No.:
 Water Depth (m): 9.6'

Sediment Texture ("feel"): Firm Silt (0-1')
Firm Silty Clay (1-5')

Sediment Core Description:

Notes: 30 cm, 5' sampler taken, but the 5' was
shorted as it did not pump sampler.
Temp = 14.4 C° pH = 6.40
TPS = 74.82 ORP = 128
Cond = 114 uS Turbidity = 32 Time = 11:03 AM

Station ID: W-07-C Coordinates: 45.56692N -122.73440W
 Sample Type: (real) calibration 45.56692N -122.73440W
 Time: 1120 Photo No.:
 Water Depth (m): 16.5'

Sediment Texture ("feel"): Clay silt bottom

Sediment Core Description:

Notes: 30 cm sample taken 11:08
Temp 14.4 pH 6.32
Cond 146.7 uS TPS 90.95
Turbidity 14.95 ORP 75

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.747</u>	<u>0.100</u>
30 cm	<u>15.085</u>	<u>0.580</u>
60 cm		

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.760</u>	<u>0.100</u>
30 cm	<u>14.911</u>	<u>0.278</u>
60 cm		

NO 5'

Initials:

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 21 of

Date: 10/28/05

Field Crew: JOE M, CHRIS S, CYNTHIA P, MATHS, ROGER D

Site: W-12-12-A

Station ID: W-06-A

Coordinates: 45.56605 N 122.73903 W

Sample Type: real calibration

45° 33.9635 -122° 44.3428

Time: 1307

Photo No.:

Water Depth (m): 12.3

Sediment Texture ("feel"): Firm Silty to Clay

Sediment Core Description:

Notes: 30cm ORP 138

Turbidity 29.2

Temp 14.5 TDS 84.5 ppm

CO₂ 129.9 ug

pH 6.10 Time 1335

Station ID: W-12-A

Coordinates: 45.56495 N -122.73728 W

Sample Type: real calibration

45° 33.8874 -122° 44.2375

Time: 1610

Photo No.:

Water Depth (m): 3.1

Sediment Texture ("feel"): SAND

Sediment Core Description:

Notes: 30cm ORP -64

Turbidity 6.02

Temp 15.8 TDS 352.5

CO₂ 522.3 ug

pH 6.10 Time

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond. (mS/cm)
Reference	<u>14.760</u>	<u>0.100</u>
30 cm	<u>15.036</u>	<u>0.450</u>
60 cm		

NO 5'

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond. (mS/cm)
Reference	<u>15.130</u>	<u>0.100</u>
30 cm	<u>16.263</u>	<u>0.24</u>
60 cm		

5' NOT TAKE

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 22 of

Date: 10/21/05

Field Crew: J. Sund, Chris S., Chris P., Matt S., Ron P.

Site: Gunderson

Station ID: GN-05A

Coordinates: 45.55803 N -122.72620 W

Sample Type: real calibration

Time: 1005

sample time: 1025

Water Depth (m): 6.8'

Sediment Texture ("feel"): 30cm silt, 30cm

Sediment Core Description: 5' silt, 5' sand on top to 11'

Notes: 30cm

Turbidity 63.5	DRP 47	Turbidity 17.9	DRP 14
Temp 14.9		Temp 13.7	
Cond 442.5 μ S/cm	TDS 251	Cond 379.5 μ S/cm	TDS 251.1
pH 6.44	Time 11:00	pH 6.25	Time 10:50

Station ID: GN4A

Coordinates: 45.55827 N -122.72677 W

Sample Type: real calibration

Time: 1247 (on station)

Photo No.:

Water Depth (m): 5.3'

Sediment Texture ("feel"): 30cm sandy silt, 5' silt

Sediment Core Description:

Notes: 30cm

Turbidity = 26.9 μ m	Turbidity = 23.7	DRP = -100
Temp = 17.9°C	Temp = 20.1°C	
Cond = 748 μ S/cm	Cond = 726.7 μ S/cm	
pH = 6.67	pH = 6.81	
TDS = 499.8	TDS = 482.6	

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.67	0.1004
30 cm	15.167	0.52
60 cm		

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.337	0.100
30 cm	15.733	0.660
60 cm		

Initials: CS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 23 of

Date: 10/21/05
Field Crew: J. SUND
Site: Gunderson

Probe Bent Aborted

Station ID: GN1E

Coordinates: N W

Sample Type: real calibration

Time:

Photo No.:

Water Depth (m):

Sediment Texture ("feel"):

Sediment Core Description:

Notes: 5' probe bent effort aborted

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference		
30 cm		
60 cm		

10/22/05
Station ID: GN-01-E

Coordinates: 45.56023 N -122.72707 W

Sample Type: real calibration

Time: 1005

Photo No.:

Water Depth (m): 27.1

Sediment Texture ("feel"): Firm sand some silt

Sediment Core Description: Station abandoned

Notes: 5' probe only no Trident taken

Repeat effort

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference		
30 cm		
60 cm		

Station abandoned
because tug & crane
came in
CS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 24 of

Date: 10/22/05

Field Crew: JPSS M, Chris S, Chris P, Ron P, Matt S

Site: GLADSTONE

Station ID: GN-01-E

Coordinates: 45.56023 N -122.72707 W

Sample Type: real calibration

45° 37.649 -122° 43.6242

Time: 11:06

Photo No.:

Water Depth (m): 26.6'

Sediment Texture ("feel"): FIRM SAND SOME Silt

Sediment Core Description: ~~Reddish~~ ~~clay~~

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference		
30 cm		
60 cm		

Notes:

5' Probe only
Turbidity 1209 ORP 3
Cond 280 uS
pH 6.08 TD 202
Temp 16.3 Time 1140

5' Probe only
No Trident

Rhone Poulenc

Station ID: R2-RP-3

Coordinates: 45.57545 N 45° 34.5270 W

Sample Type: real calibration

-122.74959 -122° 44.9159

Time: 1220

Photo No.:

Water Depth (m): 10"

Sediment Texture ("feel"): FIRM SAND

Sediment Core Description:

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference		
30 cm	<u>15.561</u>	<u>0.220</u>
60 cm		

Notes:

30cm ORP 2
Turbidity 32.1
Cond 119.9 uS TD 1 14.8
pH 6.5
Temp 16.7 Time 1243

30cm only

Initials: CS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 25 of

Date: 10/24/05

Field Crew: JOSS M, CHAS S, CHRIS P, MARK S

Site: ~~DRD-88~~ GASLO

Station ID: G5-08-A

Coordinates: 45.579131 N -122.75630 W

Sample Type: real calibration

45°34'7494 -122°45'3787

Time: 1035

Photo No.:

Water Depth (m): 4.2'

Sediment Texture ("feel"): GRAVELY SAND on top / silt underneath

Sediment Core Description:

Notes: 30cm ORD -106
Turbidity 10.65
COND 154 µS TDS 1070 µM
TEMP 15.0
pH 6.52 TIME 1055

Station ID: G5-08-D

Coordinates: 45.57950 N -122.75613 W

Sample Type: real calibration

45°34'7687 -122°45'3695

Time:

Photo No.:

Water Depth (m): 33.1'

Sediment Texture ("feel"): GRAVELY SAND on top / silt underneath

Sediment Core Description:

Notes: 30cm DRD-88 5' ORD -107
turbidity 12.1 Turbidity 63.8
COND 577 µS TDS 3384 µM COND 1210 µM TDS 823
pH 6.54 pH 6.54
TEMP 16.3 TIME 1445 TEMP 16.4 TIME 1418

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.870</u>	<u>0.100</u>
30 cm	<u>15.366</u>	<u>0.880</u>
60 cm		

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.840</u>	<u>0.100</u>
30 cm	<u>15.102</u>	<u>0.388</u>
60 cm		

Initials: CPS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 26 of

Date: 10/25/04
 Field Crew: JOSS M, CHATZ P, CHATZ S, MATH S
 Site: GA 540

Station ID: G5-07-D Coordinates: 45.57958 N -122.75642 W
 Sample Type: real calibration 45° 34.7763 -122° 45.3846
 Time: Photo No.:
 Water Depth (m): 38.2'
 Sediment Texture ("feel"): Soft silt

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference		
30 cm		
60 cm		

Notes: 5' only ORD -91
Turbidity 118
COND 1503 uS TDS 1058 ppm
Temp 17.5
pH 6.55 Time 1103

Station ID: G5-07-B Coordinates: 45.57943 N -122.75655 W
 Sample Type: real calibration 45° 34.7667 -122° 45.3939
 Time: 11:20 Photo No.:
 Water Depth (m): 3.2'
 Sediment Texture ("feel"): Sandy with some silt

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>15.071</u>	<u>0.100</u>
30 cm	<u>15.346</u>	<u>0.432</u>
60 cm		

Notes: 30cm ORD -52
Turbidity 11.3
COND 441.1 uS TDS 295.1
pH 6.57
Temp 17.5 Time 1310

5' probe abandoned
 Initials: LFS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 27 of

Date: 10/25/05
 Field Crew: 3000 M, 2MB3, 2MB8, MAT 3
 Site: GA300

Station ID: G5-02-A Coordinates: 45.58080 N -122.76060 W
 Sample Type: (real) calibration 45074.9482 -122°45.6369
 Time: 1400 Photo No.:
 Water Depth (m): 3.51

Sediment Texture ("feel"): Rock Hard silt

Sediment Core Description:

Notes: 30cm ORP -152
Turned L 19.0
COND 290.6 uS TDS 183.5
pH 5.52
Temp TIME 1530

Station ID: RR-02-B Coordinates: 45.57945 N -122.74785 W
 Sample Type: (real) calibration 45°34.5254 -122°44.8729
 Time: 1021 Photo No.:
 Water Depth (m): 27.8

Sediment Texture ("feel"): silty

Sediment Core Description:

Notes: 30cm ORP -74
Turned L 7.99
COND 2497 uS TDS 18.01
pH 6.79
Temp 14.0 Time 1018

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	15.112	0.100
30 cm	15.374	0.270
60 cm		

Screening Sample: collected not collected
 Screening Sample ID:
 Purge Rate:
 Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.770	0.100
30 cm	15.323	1.075
60 cm		

Initials: CS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 28 of

Date: 10/26/05

Field Crew: JOSS M, CHITZ S, CHITZ P, MAH S

Site: PLATE PAWANE

Station ID: R2-RP-2

Coordinates: 45.57618 N -122.74945 W

Sample Type: real calibration

45° 34.5716 -122° 44.9674

Time: 1225

Photo No.:

Water Depth (m): 2'

Sediment Texture ("feel"): SAND + Rip RAP

Sediment Core Description:

Notes: 30cm OLD -90
Turbidity 8.97
COND 345.8 uS TDS 576.5
pH 6.86
Temp 15.6 TIME 1305

Station ID: R2-RP-1

Coordinates: 45.57685 N -122.74968 W

Sample Type: real calibration

45° 34.6067 -122° 44.9819

Time: 1420

Photo No.:

Water Depth (m): 26.4

Sediment Texture ("feel"): ~~SAND + Rip RAP~~ SAND

Sediment Core Description:

Notes: 30cm ORP -99
Turbidity 34.2
COND 1906 uS TDS 1344
pH 6.58
Temp 14.8 Time 1500

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.909</u>	<u>0.100</u>
30 cm	<u>15.461</u>	<u>0.640</u>
60 cm		

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	<u>14.850</u>	<u>0.100</u>
30 cm	<u>15.198</u>	<u>0.729</u>
60 cm		

Initials: CS

LWG Round 2 Groundwater Study Trident Field Data Sheet

page 29 of

Date: 10/27/05

Field Crew: Jess Chris S., Chris P., Matt C., Matt S.

Site: Rhone-Paulenc

Station ID: RP2-E

Coordinates: 48.57728 N -122.74952 W

Sample Type: real calibration

Time: 0930

Photo No.:

Water Depth (m): 45'

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Sediment Texture ("feel"): silty sand

Sediment Core Description:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.610	0.100
30 cm		
60 cm	15.302	1.407

Notes: 30cm

Cond: 2803 pH: 6.77

Temp: 13°

Turb: 50.9

TDS: 2050 ppm

ORP: -50

5'

Cond: 1418 pH: 6.65

Temp: 13.7°

Turb: 1.05

TDS: 981.8 ppm

ORP: 23

first trident reading faulted.

Station ID: RP3-E

Coordinates: 45.57782 N -122.74913 W

Sample Type: real calibration

Time: 1213

Photo No.:

Water Depth (m): 44.5

30cm 5'

Sediment Texture ("feel"): silty sand / sand

Sediment Core Description:

Screening Sample: collected not collected

Screening Sample ID:

Purge Rate:

Screening Sample Analytes:

Trident Readings:

	Temp (°C)	Cond (mS/cm)
Reference	14.590	0.100
30 cm		
60 cm	15.271	1.426

30cm

Notes: Cond: 3311 mS ORP: -12

Temp: 13.7°

Turb: 3200

TDS: 2624 ppm

pH: 6.58

5'

Cond: 368.6 mS

Temp: 14.4°

TDS: 244 ppm

pH: 6.55

ORP: 54 Turb: 825

Initials:

page 30 of _____

Site: Rhone-Poulenc

Sediment Core Description: _____

Screening Sample Analytes: _____

	Temp. (°C)	Cond. (mS/cm)
Reference	14.473	0.000
30 cm		_____
60 cm	14.222	1.490

QRP: -37

Sediment Core Description: _____

Screening Sample Analytes: _____

	Temp. (°C)	Cond (mS/cm)
Reference		
30 cm		
60 cm		

Notes: _____

Initials: _____



Appendix B



PORTLAND HARBOR RI/FS
ROUND 2 GROUNDWATER PATHWAY ASSESSMENT
TRANSITION ZONE WATER SAMPLING
FIELD SAMPLING REPORT

APPENDIX B
SMALL-VOLUME PEEPER FIELD NOTES

DRAFT

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

January 31, 2006

"Rite in the Rain"
ALL-WEATHER WRITING PAPER



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Phone 303.404.2944 x17

Project LWG Peeper Deployment
+ Retrieval - Phase 1:
Arkema Acid Plant, Arkema
Chlorate Plant, Arco,
Wacker Siltronics

CONTENTS

PAGE	REFERENCE	DATE
4-6	Arkema Chlorate Plant	10/17/05
1-4	Arkema Acid Plant	10/17/05
9-10	Arco	10/18/05
7-8	Wacker Siltronics	10/18/05
11-13	Wacker Siltronics	10/19/05

2 10/17/05
 7 am CH met ED at the field lab, reviewed
 Oregon sampling procedures, Health &
 Safety Plan meeting, transported
 coolers to vehicle. ~~CH~~

7:45 am CH arrived at Cathedral
 Park, met Eric Baker + safety diver.

Boat preparations, launching.

9:00 am: called coast guard,
 Sheriff's office, + Fred
 Wolfe at Arkema. Safety +
 health meeting.

9:15 am: Divers change into
 dry suits. ~~CH~~

9:30 am - depart boat ramp

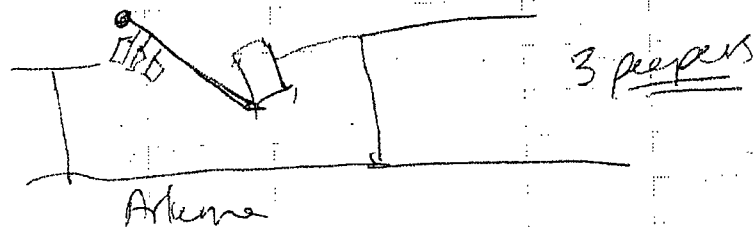
9:40 am - arrive Arkema Acid
 Plant. Place buoys at all 3

stations. Measured trail lengths
 at all stations. 135 ft trail
 needed for AP03D. 40 ft trail

needed for R2-AP-1. This is
 the duplicate location. 75 ft
 trail needed for AP04C.

All three locations tied/anchored
 to same piling. This is the
 corner post of the square
 formation on the center dock.

AP03D 10:30 am



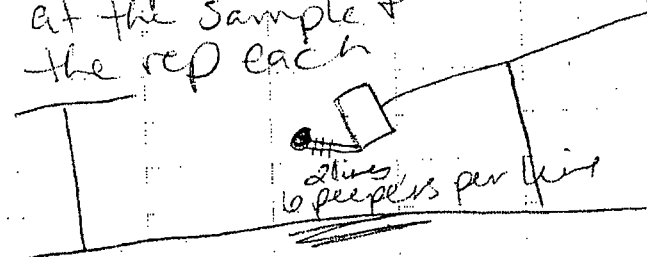
Tied off to the most inshore of
 the four posts of the square - the
 one with the metal cable
 attached to it.

Smooth - no problems with
 installation.

3 pingers installed at this
 location.

R2-AP-1 (Replicate location)

Tied off to same piling.
 6 pingers tied off:
 at the sample +
 the rep each.



4 ^{CCT} ~~AP04C~~ → AP04C: 11:30 am
Tied to same piling



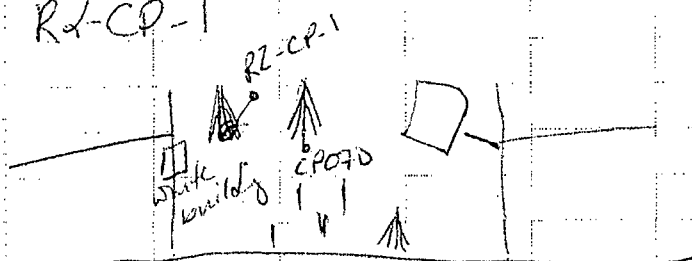
Everything went in easily,
no need for hammer

12:30 pm - lunch

1:00 pm - Headed over to the
Arkema Chlorate Plant

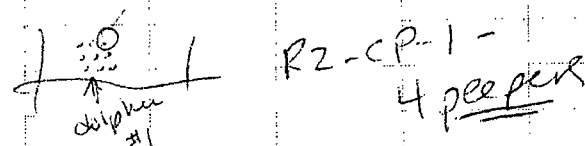
1:15 pm - Tied/anchored ^(upstream of)
the first dolphin inside the
center dock (the dock with
the little white building on it.)
(see pics 2-4)

R2-CP-1



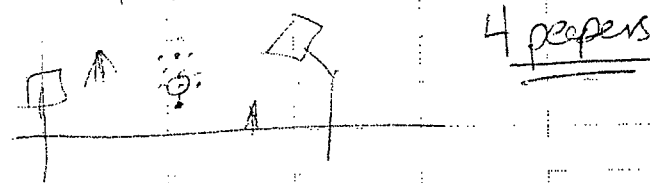
tied off to offshore upstream piling

There are only 2 dolphins
in between the Chlorate Plant
docks. Tied off to the dolphin
closest to the center dock.



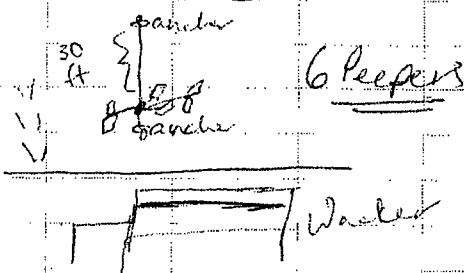
All silt - no need for hammer
CP-07-D: 1:54 pm

Tied/anchored to the second dolphin
between the chlorate plant docks.
Tied to center inshore piling, 2ft
inshore of this:



The GPS location was almost exactly
on a dolphin structure, which
matched the map of the
site. On the map, the station
was just inshore of the dolphin
and therefore the samplers

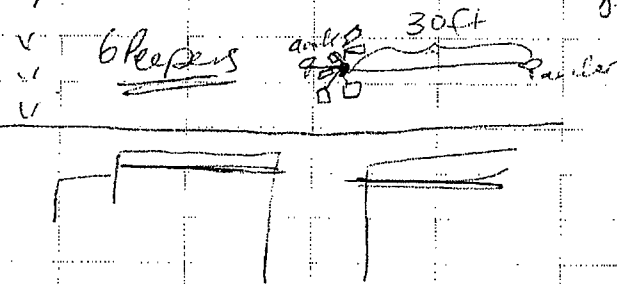
SLT2-C



line runs perpendicular to
shore 30 ft

12:20pm: SLT3-C

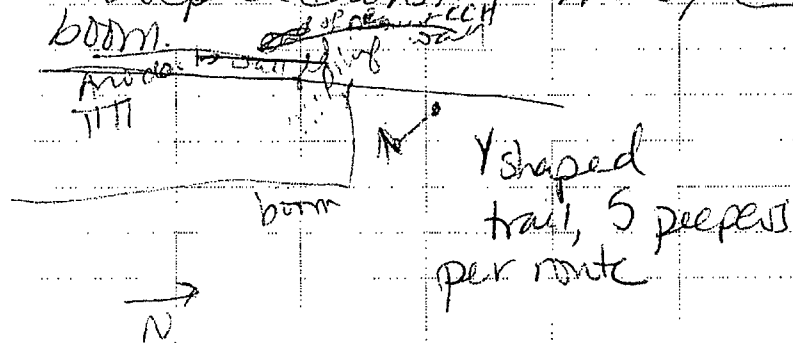
Directly offshore of gap
between two big green-
striped Silttronic boulders



All silt, no debris at
bottom.

12:50 departed Silttronic for
Arco.

1:00pm arrived at Arco. Goss spoke
with Scott Vawter when he
and the Trident crew were
here earlier today and
informed them of our visit.
Scott gave clearance for
our deployment. It is 2 1/2 hrs
before low tide and peeper
location is 6 inches underwater.
Therefore, to ensure that
peepers would remain
underwater at all tides, peepers
were placed ~4 ft further
offshore than actual station ID.
Most shallow peeper is
~2 ft below surface at
time of placement, with another 1 ft drop
Tied off to broken piles
on dolphin downstream of boom.
boom.



One of the peeper came untied from the route line (untied from the beamer).

This one is next to the anchor between the two legs. Should be able to find it on retrieval anyway.

All peeper were put in by divers above water - shallow enough that no descent was necessary. Rocky bottom, hammer required to install all peeper. — CCH

2:24 pm - Left Apo — CCH

2:40 pm - Arrived at Gasco for work Eric is doing to them.

04:40 pm - Left Gasco for Cathedral Park — CCH

5:10 pm Arrived at field lab, offloaded coolers and oxygen tanks. — CCH

5:30 pm: Left field lab for the day.

CCH

10/19/05 8:45 am arrived at field lab, checked all knots on peeper to be deployed today. Found 1 errant knot that slipped + needed to be retied. Loaded vehicle. — CCH

9:30 am arrived Cathedral Park. Loaded coordinates for last 4 Siltronic stations.

10:15 am: arrived Siltronic. Called Coast Guard, Sheriff's Office, & Tom McCue at Siltronic. No answer from Tom McCue, so left a message explaining our deployment plan for the day and contact information.

Placed three buoys for SLT1-E, SLT2-E, and SLT3-F.

10:30 am SLT3-F - replicate location. 6 Peeper each.

SLT3-F anchor

~~lines~~ ^{cut} lines are 25 ft long, extending upstream from the station location. The repeat line is 20 ft long. These line lengths do not include length necessary for knots - therefore, final length ~~cut~~ is shorter.

12:05 pm: SLT2-E - located directly offshore of edge of Siltronics most shoreward downstream building. 6 peepers down at this location. Diver reported logs and debris at bottom, but no trouble with peeper placement. ~~cut~~

12:57 pm: Since these two stations were so deep (45 ft), returned to boat ramp to get additional air. ~~cut~~

1:20 pm: Returned to Siltronics. Placed buoy at SLT4-F. This location is directly in front (offshore) of the cream-colored ducts on the upstream-most Siltronics building.

Correction, this location is ~20 ft downstream of the duct work. ~~cut~~

1:50 pm: Diver saw to lay trail parallel to shore and upstream of station. Diver reports a lot of wood debris on bottom.

Trail for SLT4-F runs slightly inshore (as opposed to parallel) along the inshore side of a log. ~~cut~~

2:32 pm: SLT4-F

Directly offshore of the two lines of pilings at the downstream end of Siltronics site - only pilings at the site.

Trail laid parallel to shore heading upstream. Some logs at the end of the trail but otherwise unobstructed. ~~cut~~

3:16 pm: Diver completed, pulled up buoys.

Coordinates:

Artemia Acid Plant
AP-03-D (3 peepers)

10/17

$\frac{x}{7627903.0}$ $\frac{y}{702564.7}$

R2-AP-1 (6 peepers, REPLICATE)

$\frac{x}{7627920.9}$ $\frac{y}{702469.0}$ 10/17

AP-04-C (6 peepers) 10/17

$\frac{x}{7627967.5}$ $\frac{y}{702395.1}$

Artemia Chlorate Plant: 10/17
R2-CP-1 (4 peepers)

$\frac{x}{7628267.77}$ $\frac{y}{702129.63}$

CP-07-D (4 peepers) 10/17

$\frac{x}{7628349.099}$ $\frac{y}{702023.4252}$

CP-09-D (4 peepers, replicat) 10/18

$\frac{x}{7628527.849}$ $\frac{y}{701817.853}$

CC4

ARCO

AR-03-A (5 peepers, replicat)

$\frac{x}{7618589.0}$ $\frac{y}{711566.6}$

Wacker Siltronics

10/19

SLT1-E (6 peepers)

$\frac{x}{7624677.5}$ $\frac{y}{705395.4}$

SLT2-C (6 peepers)

10/18

$\frac{x}{7624743.4}$ $\frac{y}{705276.9}$

SLT2-E (6 peepers)

10/19

$\frac{x}{7624788.9}$ $\frac{y}{705348.6}$

SLT3-C (6 peepers)

10/18

$\frac{x}{7624874.3}$ $\frac{y}{705196.6}$

SLT3-F (6 peepers, REPLICATE)

10/19

$\frac{x}{7624923.1}$ $\frac{y}{705290.1}$

SLT4-F (6 peepers)

10/19

$\frac{x}{7625048.5}$ $\frac{y}{705195.4}$

11/14/05 8:00am. Met at field lab Cynne Henderson, Jane Surd, + Alice Worrel. loaded van.
 8:15am arrived at Cathedral Park, loaded boat, conducted health and safety meeting.
 9:15 Arrived Alameda Acid Plant, tied off. Found peeper location.
 First sample: APO4C. 6 peepers. No problems locating samples.
 First used spray bottle, but to clean peepers, but switched to hose (both using Willamette water).
 Collected metals, conventional perchlorate, 2 VAs for VCs, and pesticides.
 10:45 second sample R2-AP-1. During sampling of VCs, one VA vial ~~so~~ shattered. The remaining

water in this vial was poured (slowly, along the side) onto a third VA vial, and this vial was used.

11:30 - Replicate Sampler - R2-AP-1 - 2

12:00 APO3D - 3 peepers, all pesticides.

No problems with retrieval, all samples recovered, no cells were ~~the~~ compromised in any of the peepers. Extra volume added to metals containers in all cases. ^{Diver reports lots of debris at this location.}

12:45 - Back to boat ramp for break + lunch.

~~12~~ 13:20 - Left boat ramp for Chlorate Plant.

13:45 - R2-CP-1 - found peeper without trouble. Softer silt here, easier to clean peepers.

Water has a slight yellow tint. No cells are compromised.

14:25: CP-07-D. Again, softer mud here. No cells compromised. As with R2-CP-1, extra water to metal container. Water in this sampler just a little bit yellower than R2-CP-1.

15:05: CP-09-D - CP-09-D2. One of the 8 samplers had a little brown staining at the top. The water from all of the peepers was the yellowest of all CP locations, though it was not orange. No problems with flux retrieval.

16:10 Return to boat ramp, unload.

16:40 arrive field lab, prep for next day.

11/15/05

8:00 Arrive field lab, pack van. Heavy fog today. Can't see 25 ft in front.

9:00 Waiting at boat ramp for fog to lift. Spoke with Scott Vauter at ACO, he said no barges today, so this will be our first location after the fog lifts. Called Sheriff and Coast Guard.

9:30 Still waiting for fog to lift.

10:15 Arrive ACO. Locate pleepers, but lanyard has been cut (AR04B), and lead rope, anchors, and beeners have been stolen. Four of the five pleepers were had exposed top cells: 21 small and 9 large. These cells were excluded, and conventionals were excluded.

Missing cells were replaced with conventionals. Enough volume was collected for all other analyses. OAR04B-2 - again, some cells at top were uncovered. However, less so than the other samples. One of the 5 peepers, that had crusty orange brown staining on the first 14 rows of the peeper. These rows may have been uncovered and were excluded. In total 17 small and 9 large cells were excluded, (14 small - 7 large were from one peeper). In addition, one large - one small cell on a different peeper were upped, and those cells were also excluded. Again, no conventionals were collected, but

enough volume was available for all other analyses.
 12:35: Returned to boat ramp for lunch and a break. ~~cell~~
 13:15: Departed boat ramp for Sitronics. Called Tom McNue, but did not reach him, left a message. ~~cell~~
 13:20: Arrived Sitronic, entered coordinates for SLT1-E. + SLT2-E. Dropped buoy for SLT1E.
 13:30: Diver down at SLT1E
 14:30: Diver located peepers. Samples are bubbly, seem aerated somewhat. Water is clear.
 15:20: Return to Cathedral Park. ~~cell~~
 16:00: Unload at field lab.

~~cell~~

~~#116~~ 11/16/05

8:20 Arrive Cathedral Park

8:45 Depart for Wacker

S. Thomas locate SLT2E

9:20 Diver down Peepers located, brought to surface.

One of the peepers had ~~the~~ ^{CCH} a material on

the bottom wedge that appeared to be like tar.

Water is somewhat bubbly.

One torn small cell, no

other difficulty.

10:40 SLT3F Replicate

location SLT3F collected

without difficulty, clear

water, no broken cells.

12:00 Return to Cathedral

Park for lunch and break.

13:00 SLT3F-2, retrieved

this replicate, no compromised

cells, clear water. ~~CCH~~

14:00 SLT4F. 2 of the 6

peepers again had the

sticky, tarry residue

on the wedge ends (see photos). No cells were compromised, water was clear, all peepers retrieved. ~~CCH~~

#15:00: SLT2C. All

peepers retrieved,

no compromised cells,

clear water. ~~CCH~~

16:10 Return to Cathedral

Park ~~CCH~~

16:40 Return to field lab. ~~CCH~~

CCH

11/17/05:

8:30 am: Arrive Cathedral
Park.9:00 am: Arrive Gilkerson,
made calls. Over
upped his suit and
had to change shirt.
9:45 SLTBC.

2

10/31/05

Peeper Deployment

B010152

T.SUND

0715 At field lab to pack
up gear.

0745 Eric Parker and Don (RSS)
meet @ Field lab to load
gear. + mob to Kinder
Morgan Linton (for
deployment @ upland
access location.

Health + Safety briefing
prior to departure

0820 At Kinder Morgan Linton
Eric's truck is acting
up, he is not sure
what's wrong - calling
Ford.

Meet Nate Hemphill (Delta)
@ KM + sign in @ Shop.

- Weather: rainy + cool (50's) -

Discuss deployment location

Nate says access is

down bank - be careful

of loose rocks + slippery
conditions.

We all walked to docks

row.
T. Sund. Integral
E. Parker RSS
Don. Parker

10/31/05 Peeper Deploy

to assess ac
was determi

it would be s
more effici

Eric is going
truck in this

as he is not
towing boat w

engine probl
is having.

Called Christ
discuss. We

all locations

0900 Depart KM -

Lab + Eric +

truck repair.

0925 Eric called -

Seems to be

he + Don are

Park setting.

0950 Tides for Po

Low @ 117.

High @ 504

Low @ 111,

88

2

10/31/05

Peeper Deployment

Bo10152

J. SUND

0715 At field lab to pack
up gear.

0745 Eric Parker and Don (RSS)
meet @ Field lab to load
gear. + mob to Kinder
Morgan Lintner (fer
deployment @ upland
access location.

new
J. Sund-Integral
E. Parker
Don-Perkins

Health + Safety briefing
prior to departure

0820 At Kinder Morgan Lintner
Eric's truck is acting
up, he is not sure
what's wrong - calling
Ford.

Meet Nate Hemphill (Delta)
@ KM + sign in @ Shop.

- Weather: rainy + cool (50's) -

Discuss deployment location

Nate says access is
down bank - be careful

of loose rocks + slippery
conditions.

We all walked to docks

8

10/31/05

Peeper Deployment

Bo10152

J. SUND

to assess access. IT
was determined that
it would be safer +
more efficient.

Eric is going to take
truck in this morning
as he is not comfortable
towing boat with the
engine problems it
is having.

Called Christine to
discuss we will access
all locations from boat.

0900 Depart KM - Jane to
lab + Eric to get
truck repaired.

0925 Eric called - Truck
seems to be doing better
He + Don are @ Cathedral
Park setting up boat.

0950 Tides for today

Low @ 117am High @ 500pm

High @ 504am

Low @ 111pm

8

4
10/31/05 Peeper Deployment B010152
J. Smith

1000 at Cathedral Park, load
boat and set up oxygen
tanks to bubble coolers
1035 Call Coast Guard, Sheriff
and Nate Kempf (Delta
for KM)
Mob to Kinder Morgan.
1st location, KM-06A,
dock boat on beach
on DS side of docks.
Walk to location w/
GPS. GPS not receiving
signals, so estimate
~30' from US inside
dock.
Tie off to bid piling on
walkway from main dock.
End of line in line w/
4th piling from walkway
on main dock.
1140 Deploy Peepers @ KM-06A.
1212 Tie off lines for 10-A + 11-B
on short piling on shore ~
35' from walkway to dock.

18

10/31/05 Peeper Deployment B010152
J. Smith

1236 Set up for deployment
@ KM-10-A + 11-B
(11-B line ~ 100 feet off
piling)
1250 Deploy 5 Peepers @ KM-11-B,
Deploy Duplicate Peeper
Set @ KM-11-B (5 peepers)
(Helicopter circling in
the above from St. Johns
Bridge to KM)
1315 ON TO KM-10-A, DEPLOY
5 PEEPERS. ERIC SAYS
PRETTY HARD HERE, MEDIUM
SAND, DROP OFF ~ 4.0' FROM
SAMPLES
(11-B sandy silt)
1340 Pull ANCHORS, move to
R2 KM-2.
1412 DIVER IN AT R2 KM-2
1423 DEPLOY 5 Peepers @ R2 KM-2
1430 Diver out, all peepers in
@ Kinder Morgan.
1450 Mob to Gunderon, caller
contacted Dave Kinn (Kinnely)

18

10/31/05 Peeper Deployment

BIO 152
J. SWO

and Gunderson gate re:
access. We are clear
to deploy samplers @
Gunderson. Today Plan
is to get 2 peepers @
GN-04B

1541 AT GUNDESON, DROP BUOY
and set up for peeper deploy
(2) @ GN-04-B. ^{tie off on} beam on dolphin

1555 contacted Lakeside (Pat)
and Shaver (Joe) regarding
access for tomorrow
(after 10am barge out, so
all in morning for Shaver
schedule)

1545 Diver in.

1505 Deploy 2 peepers @ GN04B

1510 Pick up anchors and mob
to GN 03A

Buoy set off ⁱⁿ piling on DS side
of Lake side dock (piling court
is from diagonal beam on walking
shore)

1612 Diver in.

[Signature]

10/31/05 Peeper Deployment

BIO 152
J. SWO

1615 Deploy 2 Peepers @
GN-03-A, complete deploy

1625 Depart to Cathedral
Park

1645 AT Cathedral Park, Wood
+ head to field lab.
Call Coast Guard +

Sherriff
1730 Depart Field Lab.

[Signature]
(b) (6)

(b) (6)

10/31/05

8/1/05 Peeper Deployment B10152 J.SUND

0215 Arrive @ Field Lab,
Load gear.

0830 Arrive @ Cathedral
Park, load boat
weather: rainy + cool (50s)
Crew: J. Sund (interview)
E. Parker } RSS
Don Peterson }

Call Coast Guard + Survey
Plan: Willbridge - Chevron/KM
Gasco RP

Called KM Willbridge + CP
Chevron Willbridge -
clear to work there
Called Tim (Anchor)
Gasco + Gina (Anchor)
(Olympic?) - clear there
also.

0845 Head to W. Willbridge, W-04-C
Set up for Deployment

0930 Diver in, tie off on metal piling
by meter crane
Deploy 5 peepers @ W04C
+ 5 peepers for duplicate

JS

8/1/05 Peeper Deployment B10152 J.SUND

@ W04-C

0957 Head to W-09-C, set up
for deployment.

1015 Diver in Deploy 5 peepers
@ W09-C, tie off on
piling with bent gauge marker

1024 Diver out, complete Willbridge
Deployment

1050 Head to Gasco GSC -
Rhône Poulenc RP-07-E,

1054 Eric Parker calls Coast
Guard to let them know
we are near channel, +
for them to notify W-04-C
of diver.

Sample location is midway
bt Buoy "16" and inside
bridge abutment on DSUS
RR bridge.

1110 Diver in to deploy 4
peepers + duplicate
RP-07-E.

1140 Difficult to pound in peepers
Eric thinks built dish

JS

1038

10/11/05 Peeper Deployment

B010152
J. SUND

As peepers would not easily go in. Were able to deploy 2 peepers one to just below shoulder and one ~ 1/4 down peeper. Will attempt new location tomorrow. Called Christine + she said to try + get in area around desired location even if need to move inshore. At same time try + be offshore of closest trident location.

1250 Head to Gunderson for GN-02-E, GN-01-E, R2-GN-1

1308 Set up for deployment @ GN-02-E

1335 Diver in to deploy 2 peepers @ GN-02-E + duplicate (2 peepers)

1350 Diver out, location complete. Head to GN-01-E, R2-GN-1 mark w/ boys.

1435 Diver in to deploy 2 peepers

11/1/05 Peeper Deployment

B01015211
J. SUND

@ GN-01-E (location is on DS corner of Barge 20 + near ST 41) Set trail out toward channel

1450 Diver out, head to R2-GN-1 set up for deployment

1505 Diver in, deploy 2 peepers @ R2-GN-1. (Set trail out from location DS)

1521 Head to Diver out, GN locations complete. Head to Cathedral Park, Call Coast Guard + Sheriff.

1600 to Lab to unload. Note: Caribbeens on peepers from Day 1 + Day 2 deployment were beginning to rust.

1700 Depart Lab

BIAAP

[Signature]
11/1/05

11/2/05 Peeper Deployment BOLO 15Z J.SUND

0730 AT Field Lab, load gear
TO Cathedral Park

Weather: cool (50), Cloudy

Plan: Gasco + Rhone Poulenc

0815 Meet @ Cathedral Park
load boat, call Coast
Guard + Sheriff

0843 TO Rhone Poulenc to set
trail off original location
shoreward to determine
good location to place peepers

0900 Set 150' of trail from
RPO7-E original location
towards shore.

0940 Diver in @ Shore end of
trail from RPO7E location.
Going to descend @ this
end + follow trail to RPO7E
to determine good location
for peeper deploy.

(Note: abundant debris
floating on surface)

8 peepers deployed (4 sample,
4 duplicate)

AS

11/2/05 Peeper Deployment BOLO 15Z J.SUND

1035 Diver out, says surface
was pretty fluffy then
had to punch in last
~3 inches. Estimated to
be ~50' ^{was here} from original
location @ end of
tending line from boat
(here)

Coordinates for RPO7-E-2
85' inshore from RPO7-E

704050.906

76266.77722

Inshore coord

704009.2

7626595.3

1058 ON to GASCO, GSC7-D

#6X1-B Start @

GSC1-B. Get ~~permitted~~ 88

Discuss access w/ USACE
docks control. Have
okay to work in area.

Set trail from sample
location to dolphin
on USACE dock by

AS

19/12/05 Peeper Deployment 06015Z
J.SUND

1830 Essayon ship.

1830 Diver in. Deploy 6 peepers

@ GSC⁸ GSC1-B

Considerable pounding
required to get peepers in -
rocks, 1.5m ^{Eric says some lobb} size gravel + clay like
material

1200 Diver out. ON to GSC7-D

Tie off @ dolphin + run
trail ~ 92' out to location
(DS) (the off on along with cable)
running down

1255 Diver In. Deploy 6
peepers + duplicate
@ GSC7-D (12 peepers
total)

1325 Diver out to cathode
parker to unload
Peeper Deployment
Complete.

1500 Depart Lab

Note: Can be seen on
peepers beginning to
rust.

(b) (6)

(b) (6)

11/2/05

11/2/05 Peeper Deployment 801015Z
J.SUND

Essaun ship

1130 Diver in. Deploy 6 peepers

@ GSC7 GSC7-B

considerable pounding
required to get peepers in -
rocks, bank, size of gravel + clay, etc.

1200 Diver out. ON TO GSC7-D

Tie off @ dolphin + run
trail ~ 92' but to location
(DS) (the off trailing with cable)
running down

1255 Diver in. Deploy 6
peepers + duplicate
@ GSC7-D (12 peepers
total)

1325 Diver out to cathedral
park to unload
Peeper Deployment
complete.

1500 Depart Lab

Note: Can be seen on
peepers beginning to
rust

(b) (6)

(b) (6)

11/2/05

11/28/05 Peeper Retrieval 801015Z B15
J.SUND

0730 Arrive @ Field Lab,

load gear

0830 Arrive @ Cathedral Park

Crew: weather - cold (30s) windy
choppy, cloudy

J.SUND

A.WOOD

M. Tanner

E. Parker

Don Peterson

RSS

Call Willbridge + Gundersen

Re access to day

Plan: Conoco Phillips Willbridge

+ Gundersen Locations

on US Side of

Lakeside Dock.

0850 Call Coast Guard + Sheriff

Set up boat.

0940 HEAD TO WILLBRIDGE - CP

1010 AT W09C

1030 W09C SAMPLE TIME

1105 AT GUNDERSON, START AT

GN02E

1200 GN2E AND GN2E-2

SAMPLE TIME

1/8

16
11/28/05 Peeper Retrieval B010152B
J. SUND

1230 Anchor stuck (hung up)
on bottom. Diver in
to retrieve.

1300 ON TO GNIE

1310 FOSS TUG IN TO TAKE BARGE
STZ1 (SHAWER) BELOW ~10'
FROM BARGE, PULL OUT +
WAIT FOR TUG.

1320 BACK TO SET UP ANCHORS @
GNIE

1400 GNIE SAMPLE TIME
PEEPERS REALLY STUCK,
HAD TO USE VICE GRIPS
TO RETRIEVAL, MATERIAL
SILTY CLAYEY MATERIAL.

1425 ON LOCATION R2GN1,
DIVER IN

1440 SAMPLE TIME R2GN1
starting to RAIN, v. windy

1455 ON TO GN3A

1510 DIVER IN

1530 SAMPLE TIME GN3A

SILT W/ SOME COARSE GRAINED
SAND ON PEEPERS.

18

11/28/05 Peeper Retrieval B010152B 17
J. SUND

COMPLETE FOR DAY, HEAD
TO BOAT RAMP.

1550 CALL COAST GUARD + SHERIFF
HEAD TO LAB TO UNLOAD
SAMPLES + FILL OUT COCS
DEPART LAB

Blank
(b) (6)
(b) (6)
(b) (6)

11/28/05

18.11/29

coll/rain

BO101520
Chamley
M. Penner
A Wood

Call - Gunderson, Shaver, Gasco

- Coast Guard, Sheriff

850 Underway to Gunderson

920 At Gunderson - setting up (1 Location)
G.N. 04-B

1010 Collection Complete - Successful

1015 Underway to Gasco

Discussion w/ Tim Browning

- Kinder Morgan access

This afternoon + Tomorrow

1025 On location @ GSC1B

Set up anchors

1045 Diver in

Peeper difficult to retrieve

1115 Diver up with 5 peepers (1 Broken)

Diver getting more air + return

for last peeper → retrieved ✓

- Top 2 to 3 layers = show

iron staining on 3 peepers

(assumed above mudline + not used)

★ STRONG PETROLEUM ODOR from peepers

- multiple ~15 cells w/ broken mud cores
(not used)

- No conventionals → limited volume on TPH/D/perc
1153 → Cathedral Park for lunch

1248 - Onsite at Gasco GSC1B ✓

1306 Peepers up
+ Processed

No problems

1400 Replicate GSC1B pulled
(Peeper 5 → top 3 rows

iron oxide stain
→ not used)

- No odor

1503 On location @ Kinder Morgan
Leiston

KM11B → pull up Peal sample

- leave replicate for tomorrow

KM11B retrieved @ 1540

- all 5 peepers

- Return to Cathedral Park

1620 At Cathedral Park

- Call Coast Guard + Sheriff

- Supplies for tomorrow

- Sharps

- Long Nitrile Gloves

- Paper towels

- Sharpies

11/30/05

C Hawke
M Tange
A Wood

8:30 - Call Coast Guard / Sheriff

- Call KM

- Call Willbridge - message left

9:00 - Call received from

Wally Stevens - Willbridge

Barge coming @ noon → no opening
for access until next week

∴ Redirect to Willbridge

9:30 on location - W4C + W4C-2

9:37 - Diver in

Peepers Recovered

3 rows of peepers 5' shore
iron oxide (not sampled)

Replicate Retrieved + sampled

- no problems

1055 - Underway to KM Linton

1118 - Prep to collect

replicate KM11B-2

1220 - Peepers Retrieved @ KM10A

- difficult to retrieve

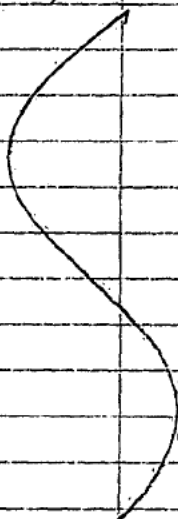
1315 - Divers walk in + retrieve

KM6A → all in tact

1415 Diver in @PKM2

1537 Peeper Processing Complete
Return to Cathedral Park

- Call Coast Guard + tell
them we are finished for
the day



(b) (6)

12/1/05

C Hawley
M Tanner
A Wood

8:30 Call Coast Guard

Call Sheriff

Call Tim Browning (let him know
we are done
@ KM Location)

8:50 Underway to Rhone Poolenc

9:42 Diver in

9:57 Both Pairs of Peepers
Recovered (9 total peepers)

RPO7E

RPO7E-Z

* second peeper to the boat
was used as a probe
when diver was initially
looking for place to
deploy peepers. The peeper
was only half buried
& was matted by clear
iron oxide staining. peeper
was not sampled.

10:30 Back to Cathedral
Park. Sampling complete
Call Coast Guard + Sheriff

Call





PORTLAND HARBOR RI/FS
ROUND 2 GROUNDWATER PATHWAY ASSESSMENT
TRANSITION ZONE WATER SAMPLING
FIELD SAMPLING REPORT

APPENDIX C
POWER-GRAB FIELD DATA SHEETS

DRAFT

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

January 31, 2006

11/29/05 LWC TZW SEDIMENT - SHIPBOARD - BOI 401-521
J. MOORE

0705 ARRIVE FIELD AT COAST FOR THE 1ST TIME
MOB TO CATHARAL PARK

PERSONS: J. MOORE, J. JONES, INTELLIGENT
A. GORDON, MISS

SCOPE: TO SAMPLE SURFACE SEDIMENT AT ARCO
+ ELECTRONIC LOGGING - PETER R. POWER
CLAB VESSEL. COLLECTING CHEMICAL SAMPLES
ACCORDING TO THE TZW ON SEDIMENT FSP
ADDITIONAL + QAP.

0730: ARRIVE CATHARAL PARK, LOAS OF BOAT.
READY BOAT FOR SAMPLING

0800: CONDUCT COMPREHENSIVE HEALTH AND SAFETY
MEETING

- CALL ARCO FIRST CLEARANCE - ACCESS GIVEN
- CALL COAST GUARD + SHERIFF

0900: MOVE TO ARCO - BEGIN AN EXAMINATION

0920: ARRIVE AR2A

0925: AR2A-g1 45°35.7554'N 122°46.8000'W 3.0 FT DEPTH
White boom extends from Arco property
line DS to a halt + way of sand +
gravel property

0945: Shum on water inside Boom.
End Sample of AR2A. Jaws bent on PG
due to gravel

1000: Jaws on GRAB FIXED - READY - MOB TO

1019: R2AR1-g1 45°35.7312'N 122°46.7754'W 0.0 FT DEPTH
Bow ARCO NO, TARGET IS 20 FT INSIDE @ BEARING 209°

1050: R2AR1-g2 45°35.7317'N 122°46.7763'W 1.0 FT DEPTH
REPLICATE SAMPLE

11/29/05 LWC TZW SEDIMENT BOI 401-521
J. MOORE

1055: ON TO R2AR2, 20' OS OF LOCATION DUE
TO RIPRAP + SUBMERGED PILING

1106: R2AR2-g1 REJECT DUE TO INSUFFICIENT MATERIAL
R2AR2-g2 45°35.7026'N 122°46.7411'W 4.0 FT DEPTH
TARGET IS 22 FT INSIDE @ BEARING 209°

1158: R2AR4-g1: REJECT DUE TO STEEL RODS + INADEQUATE
(INSUFFICIENT MATERIAL) BAD GPS DATA

1203: R2AR4-g2: 45°35.6522'N 122°46.6954'W 3.5 FT DEPTH
TARGET 18 FT ALONG SHORE @ 287°

1232: ARCO COMPLETE - LEAVE SITE + CONTACT ARCO.
MOBE TO SLT20N

1249: LEAVING SLT20N

1254: SLT2E-g1 REJECT, LOG IN JAW. NO GPS DATA

1302: SLT2E-g2 45°34.7569'N 122°45.3807'W 4.5 FT DEPTH

1323: SLT2A-g1 REJECT, GRAVEL IN JAW, WASHED

1325: SLT2A-g2 REJECT, RIP RAP, WASHED

1333: SLT2A-g3 45°34.7384'N 122°45.3794'W 15 FT DEPTH
QC COLLECTION LOCATION (3X VOLUME)

1405: END SAMPLE @ SLT2A. Jaws bent DUE TO GRAVEL; STRAIGHTEN
DOWN AND MOVE TO NEXT STATION

1427: SLT3F-g1 45°34.7480'N 122°45.2092'W 5.0 FT DEPTH

1446: SLT4A-g1 REJECT, RIPRAP IN JAW. NO GPS OR ELECTRONIC DATA DUE TO
COMPUTER FAILURE

1451: SLT4A-g2 45°34.7083'N 122°45.2525'W 7.0 FT DEPTH
POSITION IS DUBIOUS, RECKONING; NO ACTUAL ELECTRONIC DATA DUE TO
COMPUTER FAILURE. TARGET 20 FT INSIDE

1514: SLT4F-g1 45°34.7335'N 122°45.2389'W 4.0 FT DEPTH

1534: SLT5A-g1 REJECT, RIPRAP IN JAW 4.0 FT DEPTH

1537: SLT5A-g2 45°34.6996'N 122°45.2269'W 11.0 FT DEPTH

1552: END SEDIMENT SAMPLING, DEPART GPS AREA FOR BOAT RAMP.

1600: ARRIVE BOAT RAMP. CALL COAST GUARD + SHERIFF

1615: LEAVE CATHARAL PARK

11/29/05 TEL SEGMENT SAMPLING BOI 01-526
J. MOORE

1645: ARRIVE FIELD LAB, TAKE RESIDUE SAMPLE
FOR SULPHURIC ACID AT 1700 Ls

1730: LEAVE FIELD LAB

11/29/05
1745 Ls

TM

11/30/05 TEL SEGMENT SAMPLING BOI 01-526
J. MOORE

0715: ARRIVE FIELD LAB, LEAVE MP FOR THE DAY
MOVE TO CATHEDRAL PARK.

PERSONNEL: J. SUNG, J. MOORE, INTERCAL
D. DICKENSON, MRS

SWINE TO CONTINUE COLLECTION OF SEGMENT SAMPLES
FOR THE LOW SW TEL CHARACTERIZATION STUDY
AT THE ARKEMA AREA PLANT AND CHOCORATE PLANT
AND AT JIMBRIDGE.

WEATHER: COOL, DRY, LIGHT S BREEZE.

0745: ARRIVE CATHEDRAL PARK, LEAVE MP FOR TEL
CONDUCT SITE SPECIFIC H & S MEETING
- CATHEDRAL GUARD + SECURITY
- REVIEW AIR EQUIPMENT.

0845: MOVE TO ARKEMA

0908: AR02A-31	45°34.3195'N	122°44.6034'W	5 FT DEPTH
0931: AR02D-31	45°34.3321'N	122°44.5833'W	15 FT DEPTH
ELECTRONIC DATA TIME INCORRECT, GPS POSITION GOOD DUPLICATES AND QC TAKEN LAB QC COLLECTION			
1006: AR04C-31	45°34.2856'N	122°44.5374'W	10 FT DEPTH
1029: AR04C-32	45°34.2861'N	122°44.5386'W	10 FT DEPTH
REPLICATE GRAB SAMPLE LIGHT OIL - BEST QUALITY			
1051: RZAR2-31	45°34.2738'N	122°44.5207'W	9 FT DEPTH
1123: CP07A-31	REJECT; WASHED	GRAVEL IN JAWS	SLOPE
1129: CP07A-32	REJECT; WASHED	GRAVEL IN JAWS	SLOPE
1133: CP07A-33	45°34.2180'N	122°44.4538'W	11 FT DEPTH
TARGET 20 @ BEARING 355°			
1243: CP07D-31	45°34.2264'N	122°44.4468'W	16 FT DEPTH
1309: CP07A-31	45°34.1831'N	122°44.4117'W	6 FT DEPTH
TARGET 20 FT IN SHORE @ BEARING 255° STATION ROUGHLY 30 FT OFFSHORE AND DOWNSTREAM (2 INCHES) OUTFALL PIPE			

11/30/85 LUG TZW SEDIMENT BOY-01-525
 1336: CPO9D-G1 45° 34.1927'N 122° 44.4029'W 27 FT DEPTH J. MOORE
 AT CPO9A collected sample for TPH-g and TPH-Dx
 due to visual observation of TPH odor + sheen
 in material (sand). ~~Hold~~ Will confirm need
 for analysis. Location was 15-20' from outfall.
 1400: MOBO TO WILLABOBE - CLEARANCE GIVEN TO
 SAMPLE - 0-9A - 0-7E, 24 CHEVRO - AND
 COSCOPHILIPS
 1410: W09A-G1 45° 33.9363'N 122° 44.3056'W 7 FT DEPTH
 1440: W09C-G1 45° 33.9463'N 122° 44.2854'W 30 FT DEPTH
 1500: BDO SEDIMENT SAMPLING, DEPTH OPS USED FOR BOAT RAMP
 1520: ARIVE CATHEDRAL PARK - COSCOPHILIPS + CHEVRO
 CHANGED TO NORTH F 30METER.
 1555: MOBO TO FIELD LAB
 1555: DOWN RUBATE - LUG-2 - PG - RINGE-2 @ 1600 hrs
 1645: LEAVE FIELD LAB

GM

11/30/85
 1645 hrs

1211: LUG TZW SEDIMENT BOY-01-525
 0715: ARIVE FIELD LAB - LEAVE - MOBO TO
 CATHEDRAL PARK
 PERSONNEL: J. MOORE, J. JANS, J. STARR
 D. DICKINSON - MISS
 SCOPE: CONTINUE SEDIMENT SAMPLING WITH PRESS
 PETER - R. LOWER - CRAB - EMB - LUG - TZW - G1
 CHARACTERIZATION AT SITES: EASON, KIM
 LANTON AND VASCO, FINE PERMITTING RAIN
 FILLING
 0740: ARIVE AT CATHEDRAL PARK - GOING TO BOAT
 - PROBLEMS WITH WATER PUMP - HAVE TO CHANGE
 0830: CALL FOR LOGARAGE AT EXONORDIC, KIM
 LANTON AND VASCO - ALL CLEAR, ONE
 FUEL DANCE IN AT 0840 - 1500 hrs
 - CONTACT SITE SPECIAL AT 8 MEETING
 0930: PUMP NOT FUNCTIONING - MOBO TO KIM LANTON
 REPAIRS - CALL CORPS WARD T SPEZARD
 0940: R2KM2-G1 45° 36.2342'N 122° 47.1212'W 38 FT DEPTH
 1040: KIMBA - Cannot access by boat, walk in and
 collect sample. Location @ waterline ~~line with~~ ^{line with}
 outfall. Collect VOAS @ station. Collect remaining
 in pot + homogenize/fill on boat.
 1104: EM1A-G1 REJECT, RIPRAP IN JAWS, WASHED
 1106: EM1A-G2 REJECT, RIPRAP IN JAWS, WASHED
 LEAD LINE INDICATES IRREGULAR ROCK SLOPE, DECIDE TO MOVE ON.
 1114: EM2A-G1 45° 35.6096'N 122° 46.6534'W 12 FT DEPTH
 1138: EM3A-G1 45° 35.6000'N 122° 46.6434'W 11 FT DEPTH
 1205: LEAVE EXON. MOBO TO CPO9 - CALL EXON + KIM

12/02/05 LOC TEL DEPARTMENT BOI-07-526
 1300 MOB TO PROD LAB CAN INSTRUCTIONS (S#644)
 1310 ABOVE PRELAP. REEL FOR RINSE-4
 1320 COLLECT RINSE-4 LUG-2 PG-RINSE-4
 1345 DEN AM EQUIPMENT DEMOBS
 1400 LEAVE PROD LAB FOR PALMAD OFFICE

JM

12/02/05

1400 hrs.

LWG-GW TZW Bulk Sediment

SAMPLE LOG

Date:

12/2/05

Page: 1 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0909	RZRP3	1	0-28	sand (f-m), sub- tr. gravel (f), sub- rounded	brown	tr. wood frag	v.s.l. hydrocarbon odor	WD = 3.0' TP = 28 cm no sheen
0944	RZGN1	1	0-1 1-27	fine floc lyr silt, med plast. up to 10% f. sand	brown gray	tr. wood frag (sm.)	none ↓	WD = 36.0' TP = 27 isolate fluovets of sheen
1007	GNIE	1	0-1 1-21	fine floc lyr silt, high plast (clay)	brown gray	tr. sm wood frag	none ↓	WD = 24 cm TP = 21.0 cm isolate fluov - ob sheen sl. TPH odor
1036	GNZE	1	0-1 1-26	fine floc lyr silt, high plast (clay)	brown	wood frag	— sl. TPH	WD = 28.0' TP = 26.0 cm isolated fluovets of sheen
1115	GN5A	1	0-0.5 0.5-5.0 5.0-27	fine floc lyr sand (f-m), 30% silt silt, up to 20% sand	brown gray gray	10% wood frag, paint ps, uncontained refuse fr. wood (5-27)	— sl. TPH	WD = 7.5' TP = 27 cm tar paper in jaws. 1 lamprey in 0.5-5.0 light sheen (5-27 cm) mod TPH odor

Comments:

Date:

12/2/05

SAMPLE LOG

Page:

2 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1141	GN5A-2	1	0-0.5	fine HOC lyr	brown	—		WD = 7.5'
			0.5-5.0	sand (lt-m), 30%	gray	10% wood		TP = 27 cm
			5.0-27	silt silt, up to 20% f. sand	↓	frag, paint clumps uncontained refuse		sl. TPH odor
(b) (6)								

Comments:

Date: 12/1/05

SAMPLE LOG

Page: 2 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1306	GS4A-2	1	0-1 1-26	fine floc lyr silt (med-top plast) tr fine sand, interbedded w/ up to 2cm discont. sand lenses (30% of unit)	brown gray ↓	— milled wood ↓	strong TPH/ tar odor ↓	WD = 4.0' TP = 2" tar ball in top cm Mod-str. sheer
1340	GS7B	1	0-1 1-8 8-24	Sand (f-m), subrounded up to 10% f. gravel, subangular isolated v. rap up to 8" Sand (med) subrounded 20% silt, silt w/ up to 10% f.	brown ↓ gray ↓ gray	— ↓ wood frag ↓	— ↓ Mod TPH odor + sheer ↓	WD = 5.0' TP = 24 cm 5 corbicle + tr. shell fragments
1401	GS7D	1	0-1.5 1.5-20 20-30	Sand, rounded fine floc lyr silt, tr v.f. sand, low plast. Sand, (f-m), subrounded 25% silt	— brown gray ↓ ↓	— none ↓ ↓	— ↓ ↓ TPH sheer (mod) + blebs of free product, st. odor	WD = 38" TP = 30
1433	RP3C	1	0-1 1-12 12-24	fine floc lyr silt, low plast tr v.f. sand Sand (f-c) poorly sorted, up to 10% med gravel, subangular	brown gray ↓ ↓	— 15.0' of electrical conduit in jaws	— ↓ str. solv. odor (herbicide)	WD = 38.0' TP = 24 cm fluovets of sheer in sand
1500	RP7B	2	0-1 1-30	fine floc lyr silt, low plast, up to 15% f. sand, 15% up to 1cm lenses f-m sand (lenses 15% s)	brown gray ↓ ↓	— 15% lgt sm wood frag in lenses	none ↓ ↓	WD = 38' TP = 30 cm isolated fluovets sheer in sand

(b) (6)

Comments:

12/1/05

LWG GW T3W Bulk Sediment

SAMPLE LOG

Date: 12/1/05

Page: 1 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0946	R2KM2	1	0-1	fine floc lyr silt, low plast. w/ br f. gr. sand +	brown gray	tr. foot lets	none	WD = 38' TP = 30 cm isolated florets of sheen in silt
1040	KM8A	1	0-3 3-20	angular m-c gravel [rip rap] sand med. subangular w/ up to 20% gravel (fine) subangular, 10% silt (brown)	gray brown ↓	none ↓ ↓	none ↓ ↓	Sample collected from shore 2 waterline TP = 20 cm Foam in sediment
1114	EM2A	1	0-1 1-15	discontinuous med sand, subangular w/ lg. rip rap silt, w/ up to 10% f. sand, high plast.	brown ↓ gray ↓	none ↓ 1.5 m. wood fragment	none ↓ ↓	WD = 12.0' TP = 15 cm isolated florets of sheen in silt I corbicula
1138	EM3A	1	0-0.5 0.5-12 12-27	discontinuous fine floc sand (f-m) subrounded, up to 10% f-m gravel (subrounded) sand (m) subrounded 15% silt.	brown brown ↓ gray ↓	none ↓ ↓	mod. TPH odor ↓	WD = 11' TP = 27 cm 1.5 sheen throughout
1243	G54A	1	0-1 1-26	fine floc lyr silt (med-low plast) tr. fine sand interbedded w/ up to 2 cm discont. sand lenses (30% of unit)	brown gray ↓ ↓	tr. plant Asphalt + wood debris (roofing material)	strong TPH/tar odor ↓	WD = 4.0' TP = 26 cm mod-str. sheen

Comments:

LWG GW TZW BULK SEDIMENT

SAMPLE LOG

Date: 11/30/05

Page: 1 of 3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0908	AP2A	1	0-5	f. sand, up to 10% riprap angular (up to 5"), 15% silt, tr. rootlets	brown ↓	1 bolt (metal)	none ↓	WD = 5.0' TP = 24 cm
			5-24	sand (f-m), subrounded w/ 30% silt, low density	gray ↓		sl. pest. odor	4 corbicula (0-5 cm)
0931	AP2D	1	0-1 1-30	fine floc lyr silt, low plast. discontinuous up to 0.5 cm lenses of fine sand w/ 40% silt. Main silt has tr. f. sand	brown gray ↓	tr. rootlets	mod. pest. odor ↓	WD = 25.0' TP = 30 cm isolated fluvnets of sheen
1006	AP4C	1	0-1 1-29	fine floc lyr silt, tr. v.f. sand low plasticity	brown gray ↓	tr. leaf litter	none sl. pest. odor	WD = 10.0' TP = 29 cm no sheen
1029	AP4C-2	1	0-1	fine floc lyr. silt, tr. v.f. sand low plasticity	brown gray ↓	tr. leaf litter	none sl. pest. odor	WD = 10.0' TP = 29 cm no sheen
1052	R2AP2	1	0-2 2-29 cm	fine floc lyr silt, tr. v.f. sand low plast. up to 0.5 cm discon- tinuous f. sand (40% silt) approx. 20% black clay	brown gray ↓	plant material 150.5 mm. wood frag	sl. pest. odor	WD = 9.0' TP = 29 cm no sheen

Comments:

(b) (6)

11/30/05

Date:

11/30/05

SAMPLE LOG

Page:

2 of 3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1133	CP7A	13	0-15	silt, no plasticity 15% concrete rip rip on sfc	brown ↓	—	—	WD = 20.8' 11.0' TP = 30 cm
			15-30	sand (f-m) subrounded, up to 15% fine gravel	gray-brown ↓	some wood frag, sand blast grit (15%)	solvent odor in sand	fluvets on sand paint chips in sand
1243	CP7D	1	0-30	silt, tr. fine sand low plasticity	brown	tr. plant frag (sfc)	solvent odor thruout	WD = 26.0' TP = 30 cm isolated blebs of free product (from plugs?)
1309	CP9A	1	0-1 1-19	fine floc lyr sand (f-m), 35% silt 15% r. prap up to 6"	brown gray ↓	tr. leaflets paint chips sand blast grit (tr) 1 glass bottle	mod TTH odor, mod strong sken	WD = 6.0' TP = 26 cm * adjacent to outfall (~25-30' DS of outfall)
			19-26	silt w/ 15% f. sand 20% blk & gray mottling	gray ↓	—	↓	
1336	CP9D	1	0-15 1.5-30	fine floc layer silt, low plast., tr. f. sand 20-30 cm - 40% blk staining	brown gray ↓	—	solvent odor (20-30)	WD = 27.0' TP = 30 cm nosheen
1416	W9A	1	0-1 1-23	fine floc lyr, 10% of fine gravel, subangular silt, high plasticity (clay?)	l. brown gray	1 welding rod, yellow paint chip	 H ₂ S odor	WD = 7.0' TP = 23 cm corbicula

Comments:

(b) (6)

11/30/05

SAMPLE LOG

Date:

11/30/05

Page:

303

[illegible]

Comments: (b) (6)

11/30/05

SAMPLE LOG

Date: 11/29/05

Page: 1 of 3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0925	AR2A	1	0-2	f-m med gr sar rounded w/ tr. f. gravel subrounded (20% lg riprap up to 80%)	brown ↓ gray	no ↓ tr. fragments	no ↓ mod. TPH odor	WD = 3.0' TP = 23 cm 1. T.H. sheen
			2-23	Silt, med plast city tr. v.f. g. in sand				
1019	R2AR1	1	0-24	beach sand f-m, subround- rounded tr. subround gravel up to 15% silt	brown ↓	1 lg wood frag in grab teeth	sl. TPH odor + light sheen	WD = 0.0' TP = 24 cm
1038	R2AR1-2	1	0-24	f-m beach sand, subrounded-rounded tr. subrounded gravel up to 15% silt	brown ↓	NO ↓	sl. TPH odor + light sheen	WD = 1.0' TP = 24 cm
1106	R2AR2	2	0-4	f-m sand, subrounded w/ up to 30% riprap Silt, low plasticity up to 10% f. grained sand	brown ↓ gray ↓	no ↓	no ↓ Lsh. is mod. sheen + mod TPH odor	WD = 4.0' TP = 19 cm 4 corbicula
			4-19					
1203	R2AR4	2	0-4	f-m sand, up to 35% coarse gravel, rounded	brn ↓ gray	metal bolt	no ↓ sl. TPH odor	WD = 3.5' TP = 18 cm 2 corbicula
			4-18	f-m sand, tr. med. grained gravel, subrounded				

(b) (6)

Comments:

Date:

11/29/05

SAMPLE LOG

Page: 2 of 3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1302	SL2E	2	0-1 1-20	fine floc. layer f-m sand, subrounded up to 20% silt	brown gray	none few wood frags.	none ↓ tar odor	WD=47.5 TP=21 cm no sheen
			10-21	br. angular gravel silt, few vf. sand low plast.	gray ↓	↓		
1333	SL2A	3	0-1 1-29	fine floc lyr silt, med plast. w/ discontinuous 1cm lenses of f-m sand	brown gray	flap Rap (isolated) tr. sm. wood frag.	no mod acidic TPH odor	WD=15.0' TP=29 cm 1. TPH sheen in sand lenses LAB QC collection here
1427	SL3F	1	0-1 1-24 24-30	fine floc lyr silt, low plast. up to 10% v.f. sand sand (f-m) w/ up to 20% silt	brown gray ↓	none ↓	none isol. florets ↓ v. sl. TPH odor	WD=50.0' TP=30 cm (1-24) isolated florets of sheen
1451	SL4A	2	0-0.5 0.5-12 12-18 18-20	fine floc lyr sand (f-m) subangular w/ up to 50% v. prap; angular sand (m) subrounded tr. fine gravel, subang. silt, med. plast.	brown ↓ gray 10% mottling 1. brown gray	none ↓ ↓ ↓	none ↓ ↓ ↓	WD=7.0' TP=20 cm isolated florets of sheen on water corbicular shell

Comments:

(b) (6)

Date: 11/29/05

SAMPLE LOG

Page: 3 of 3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1514	SL4F	1	0-1 1-8 8-30	fine floe lyr silt, med plast, w up to 15% v.f. sand sand, med, subrounded w/ 15% silt (methane vesicles)	brown gray ↓	none ↓	none ↓ sl. TPH odor + l. sheen	WD = 48' TP = 30 cm
1537	SL5A	1	0-0.5 0.5-5.0 5-26	fine floe lyr f-m sand, subrounded 25% silt silt, med plast. up to 10% v.f. sand	brown gray ↓	none ↓	slight TPH Ar. sand	WD = 10.0' TP = 26 cm flavors of sheen from sand
(b) (6)								
(b) (6)								

Comments:

11/29/05